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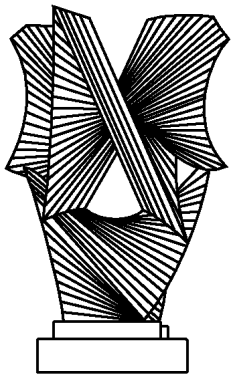

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Introduction

Challenges to the rational actor model in law and economics are almost as old as the field itself. Early skeptics about the economic analysis of law were quick to marshal arguments from psychology and other social sciences to undermine its claims.[1] But in law, critiques of the rational actor assumption by those who sympathize with the basic objectives of economic analysis have been much less common. The absence of sustained and comprehensive economic analysis of legal rules from a perspective informed by insights about actual human behavior makes for a significant contrast with other fields of economics, where such "behavioral" analysis has become common.[2] This is especially odd since law is a domain where behavioral analysis would appear to be particularly promising in light of the fact that non-market behavior is frequently involved.

Our goal in this Article is to advance an approach to economic analysis of law that is informed by a more accurate conception of choice, one that reflects a better understanding of human behavior and its well-springs. We build on and attempt to generalize earlier work in law outlining behavioral findings by taking the two logical next steps: proposing a systematic framework for a behavioral approach to economic analysis of law, and using behavioral insights to develop specific models and approaches addressing topics of

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[1] See, e.g., Mark Kelman, Consumption Theory, Production Theory, and Ideology in the Coase Theorem, 52 S. Cal. L. Rev. 669 (1979); Duncan Kennedy, Cost-Benefit Analysis of Entitlement Problems: A Critique, 33 Stan. L. Rev. 387 (1981); Arthur Leff, Economic Analysis of Law: Some Realism About Nominalism, 60 Va. L. Rev. 451 (1974).

[2] See, for example, volume 87, issue 5 of the *American Economic Review*, in which the first three articles involve behavioral economics.

abiding interest in law and economics.[3] The analysis of these specific topics is preliminary and often in the nature of a proposal for a research agenda; we touch on a wide range of issues in an effort to show the potential uses of behavioral insights. The unifying idea in our analysis is that behavioral economics allows us to model and predict behavior of relevance to law with the tools of traditional economic analysis, but with more accurate assumptions about human behavior, and more accurate predictions and prescriptions about law. Certainly a great deal of work would be necessary to justify a final evaluation of most of the topics pursued here; there is fertile ground for future research, both theoretical and empirical, and one of our principal goals is to suggest some directions in which that research might go.

We suggest that an approach based on behavioral economics will help with the three functions of any proposed approach to law: positive, prescriptive, and normative.[4] The positive task, perhaps most central to economic analysis of law and our principal emphasis here, is to explain both the effects and content of law. How will law affect human behavior? What will individuals' likely response to changes in the rules be? Why does law take the form that it does? A superior understanding of human behavior will improve answers to such questions.

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[3] The existing legal literature includes several articles that generally catalogue behavioral findings and suggest legal issues to which these findings might be relevant. See Ward Edwards & Detlof Von Winterfeldt, Cognitive Illusions and Their Implications for the Law, 59 S. Cal. L. Rev. 225 (1986); Melvin A. Eisenberg, The Limits of Cognition and the Limits of Contract, 47 Stan. L. Rev. 211 (1995); Robert C. Ellickson, Bringing Culture and Human Frailty to Rational Actors: A Critique of Classical Law and Economics, 65 Chicago-Kent L. Rev. 23 (1989); and Cass R. Sunstein, Behavioral Analysis of Law, 64 U. Chi. L. Rev. 1175 (1997). The existing literature also includes a number of articles that use behavioral insights to analyze specific topics in the economic analysis of law – primarily the Coase theorem and behavior during bargaining. These articles are relevant to a few of the issues we discuss below, and we will draw on them in analyzing those issues.

[4] For a similar distinction between positive, prescriptive, and normative analysis, see David E. Bell, Howard Raiffa & Amos Tversky, Descriptive, Normative, and Prescriptive Interactions in Decision Making, in Decision Making (David E. Bell et al. eds. 1988).

The prescriptive task is to see how law might be used to achieve specified ends, such as deterring socially undesirable behavior. Much of conventional economic analysis is concerned with this sort of question. Explicit consideration of behavioral factors can improve the prescriptions offered by the analyst. For instance, instead of focusing only on the actual probability of detecting criminal behavior in considering whether offenders will be deterred, the analyst might also want to consider the perceived probability of detection and how it might differ in systematic and predictable ways from the actual probability.

The normative task is to assess more broadly the ends of the legal system. In conventional economic analysis, normative analysis is no different from prescriptive analysis, since the goal of the legal system is to maximize "social welfare," usually measured by people's revealed preferences, and prescriptive (in our sense of the term) analysis also focuses, for the conventional economist, on how to maximize social welfare. But from the perspective of behavioral economics, the ends of the legal system are more complex. This is so because people's revealed preferences are a less certain ground on which to build. Obviously issues of paternalism are central here. Behavioral analysis suggests problems with conventional economic arguments against paternalism—based on the view that citizens invariably understand and pursue their own best interests—but also problems with many forms of government intervention, since bureaucrats are, after all, behavioral actors too.

Each of these three strands of our project is deeply constructive. Behavioral economics is a form of economics, and our goal is to strengthen the predictive and analytic power of law and economics, not to undermine it. Behavioral economics does not suggest that behavior is random or impossible to predict; rather it suggests, with economics, that behavior is systematic and can be modeled. We attempt to sketch several such models here.

Part I below offers a general framework and provides an overview of the arguments for enriching the traditional economic framework. We see this enrichment as similar in spirit to the increased emphasis on imperfect information in mainstream economic analysis in recent decades. Just as people often have imperfect information, which has predictable consequences for

behavior, the departures from the standard conception of the economic agent also alter behavior in predictable ways.

Parts II and III of the Article involve positive analysis. Part II examines how a behaviorally-informed law and economics analysis can help to explain the behavior of human agents insofar as that behavior is relevant to law. We attempt to explore some puzzles of human rationality in order to see how law has some of its effects. Part III shifts to an explanation of existing legal rules and institutions. We suggest that many features of the legal landscape that are puzzling from a traditional law and economics perspective follow naturally from behavioral phenomena.

Part IV of the paper examines prescriptive issues, offering a series of proposals that might seem puzzling or controversial from a neoclassical economic perspective but that follow naturally from taking into account features of actual choice behavior. Our principal emphasis is on how people respond to information and how this point bears on the role of law. Finally, Part V is more speculative and normative. We suggest briefly the main problems—some familiar and others less so—with the idea that the legal system ought always to respect informed choice, and also with the idea that government actors can be relied upon to make better decisions than citizens. Because of the complexity of these issues, we emphasize some broad points: the framework that behavioral economics suggests for thinking about paternalism; the possibility that some institutions—such as populist government—may be particularly bad at attempted correction, while others may be better; and the prospect that some methods of correction (such as those that focus on debiasing rather than outright coercion) may be acceptable even if one thinks that consumer error is relatively unlikely.

I. Foundations: What is "Behavioral Law and Economics"?

In order to identify, in a general way, the defining features of behavioral law and economics, it is useful first to understand the defining features of law and economics. As we understand it, this approach to the law posits that legal rules are best analyzed and understood in light of standard economic principles. Gary Becker offers a typical account of those principles: "All human behavior can

be viewed as involving participants who [1] maximize their utility [2] from a stable set of preferences and [3] accumulate an optimal amount of information and other inputs in a variety of markets."[5] The task of law and economics is to determine the implications of such rational maximizing behavior in and out of markets, and for markets and other institutions insofar as relevant to the law. Although some of Becker's particular applications of the economic approach might be thought of as contentious, the general approach underlies a wide range of work in the economic analysis of law.[6]

What then is the task of behavioral law and economics? How does it differ from standard law and economics? These are the questions we address below.

A. Homo Economicus and Real People

The task of behavioral law and economics, simply stated, is to explore the implications of *actual* (not hypothesized) human behavior for the law. How do "real people" differ from homo economicus? We will describe the differences by stressing three important "bounds" on human behavior, bounds that draw into question the central ideas of utility maximization, stable preferences, rational expectations, and optimal processing of information.[7] People can be said to display bounded rationality, bounded willpower, and bounded self-interest.

All three bounds are well documented in the literature of other social sciences, but they are relatively unexplored in economics. Each of these bounds represents a significant way in which most people depart from the standard economic model. While there are instances in which more than one bound comes into play, at this stage we think it is best to think of them as separate modeling problems. Nonetheless, each of the three points to systematic (rather than random or arbitrary) departures from conventional economic

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[5] Gary S. Becker, The Economic Approach to Human Behavior 14 (1976).

[6] See, e.g., Robert Cooter & Thomas Ulen, Law and Economics 3 (2d ed. 1997); A. Mitchell Polinsky, An Introduction to Law and Economics 10 (2d ed. 1989); Richard A. Posner, Economic Analysis of Law 3-4 (5th ed. 1998).

[7] For a further elaboration of this view, see Richard H. Thaler, Doing Economics Without *Homo Economicus*, in Exploring the Foundations of Research in Economics: How Should Economists Do Economics? 227 (Steven G. Medema & Warren J. Samuels eds., 1996).

models, and thus each of the three bears on generating sound predictions and prescriptions for law. They also provide the foundations for new and sometimes quite formal models of behavior.

1. Bounded rationality

Bounded rationality, a term first introduced by Herbert Simon, refers to the obvious fact that human cognitive abilities are not infinite. We have limited computational skills and seriously flawed memories. People can respond sensibly to these failings; thus it might be said that people sometimes respond rationally to their own cognitive limitations, minimizing the sum of decision costs and error costs. To deal with limited memories we make lists. To deal with limited brain power and time we use mental short-cuts and rules of thumb. But even with these remedies, and in some cases because of these remedies, human behavior differs in systematic ways from that predicted by the standard economic model of unbounded rationality. Even when the use of mental short-cuts is rational, it can produce predictable mistakes. The departures from the rational model can be divided into two categories: judgment errors and decision making behavior. Judgment errors are departures from models of rational expectations and Bayesian forecasting; decision making behavior reflects departures from expected utility theory.

Judgment errors often arise because of the use of rules of thumb. As stressed in the pathbreaking work of Daniel Kahneman and Amos Tversky, for example, rules of thumb such as the availability heuristic—in which the frequency of some event is estimated by judging how easy it is to recall other instances of this type (how "available" such instances are)—lead us to erroneous conclusions. People tend to conclude, for example, that the probability of an event (such as a car accident) is greater if they have recently witnessed an occurrence of that event than if they have not.[8] What is especially important in the work of Kahneman and Tversky is that it shows that short-cuts and rules of thumb are predictable. While the heuristics are useful on average (which explains how they

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[8] Amos Tversky & Daniel Kahneman, Judgment Under Uncertainty: Heuristics and Biases, in Judgment Under Uncertainty 3, 11 (Daniel Kahneman, Paul Slovic, & Amos Tversky eds., 1982).

become adopted), they lead to errors in particular circumstances. This means that someone using such a rule of thumb may be behaving rationally in the sense of economizing on thinking time, but such a person will nonetheless will make forecasts that are different from those that emerge from a proper Bayesian model, and are thus different from those that would emerge from a standard economic model.

Just as the rational expectations model is not a good description of actual human judgment, expected utility theory is not a good description of actual decision making behavior. While the axioms of expected utility theory characterize rational choice, actual choices diverge in important ways from this model, as has been known since the early experiments by Allais and Ellsberg.[9] There has been an explosion of research in recent years trying to develop better formal models of actual decision making. The model offered by Kahneman and Tversky, called prospect theory, seems to do a good job of explaining many features of behavior, and so we draw on that model (whose main features we summarize in Part IV.B below) here.[10]

We emphasize that bounded rationality is entirely consistent with modeling behavior and generating predictions based on a model, in line with the methodology of conventional economics. As Kenneth Arrow has explained, "[T]here is no general principle that prevents the creation of an economic theory based on hypotheses other than that of rationality… [A]ny coherent theory of reactions to the stimuli appropriate in an economic context … could in

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[9] See Colin Camerer, Individual Decision Making, in Handbook of Experimental Economics 587, 619-20, 622-24 (John H. Kagel & Alvin E. Roth eds., 1995) (describing Allais paradox); Daniel Ellsberg, Risk, Ambiguity, and the Savage Axioms, 75 Q.J. Econ. 643 (1961).

[10] See Daniel Kahneman & Amos Tversky, Prospect Theory: An Analysis of Decision Under Risk, 47 Econometrica 263 (1979). For a survey of empirical tests of this and other models, see Camerer, supra note 9, at 626-43. John D. Hey & Chris Orme, Investigating Generalizations of Expected Utility Theory Using Experimental Data, 62 Econometrica 1291 (1994), suggest that expected utility theory performs fairly well, but they do not consider prospect theory as an alternative. An alternative to prospect theory for modifying expected utility theory is Itzhak Gilboa & David Schmeidler, Case-Based Decision Theory, 110 Q.J. Econ. 605 (1995).

principle lead to a theory of the economy."[11] Arrow's example here is habit formation; that behavior, he says, can be incorporated into a theory by supposing that people choose goods with an eye towards minimizing changes in their consumption. "Though there is optimization in this theory, it is different from utility maximization; for example, if prices and income return to their initial levels after several alterations, the final bundle purchased will not be the same as the initial bundle. This theory would strike many lay observers as plausible, yet it is not rational as economists have used that term."[12]

2. Bounded willpower

A second bound on human behavior is bounded willpower. This term refers to the fact that human beings often take actions that they know to be in conflict with their own long-term interests. Most smokers say they would prefer not to smoke, and many pay money to join a program or obtain a drug that will help them quit. As with bounded rationality, most healthy people recognize that they have bounded willpower and take steps to mitigate its effects. They join a pension plan or Christmas Club to prevent undersaving, and they don't keep tempting desserts around the house when trying to diet. In some cases they may vote for or support governmental policies, such as social security, to eliminate any temptation to succumb to the desire for immediate rewards.[13] Thus the demand for and supply of law may reflect people's understanding of their own bounded willpower; consider "cooling off" periods for certain sales and also programs that facilitate or even require saving.

3. Bounded self-interest

Finally, we use the term bounded self-interest to refer to an important fact about the utility function of most people: people generally care, or act as if they care, about others, even strangers, in some circumstances. (Thus, we are not questioning here the idea of utility maximization, but rather the common assumptions about

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[11] Kenneth J. Arrow, Rationality of Self and Others in an Economic System, in Rational Choice: The Contrast Between Economics and Psychology 201, 202 (Robin M. Hogarth & Melvin W. Reder eds., 1987).

[12] Id.

[13] See Deborah Weiss, Paternalistic Pension Policy, 58 U. Chi. L. Rev. 1275 (1991).

what that entails.) Our notion is distinct from simple altruism, which conventional economics has emphasized in areas such as bequest decisions. Self-interest is bounded in a much broader range of settings than conventional economics assumes, and the bound operates in ways different from what the conventional understanding suggests. In many market and bargaining settings (as opposed to nonmarket settings such as bequest decisions), people care about being treated fairly and want to treat others fairly if those others are themselves behaving fairly. As a result of these concerns, the agents in a behavioral economic model are both nicer and (when they are not treated fairly) more spiteful than the agents postulated by neoclassical theory. Formal models have been used to show how people deal with both fairness and unfairness; we will draw on those models here.

4. Applications

The goal of this Article is to show how the incorporation of these understandings of human behavior bears on the actual operation and possible improvement of the legal system. The Appendix summarizes some key features of each of the three bounds on human behavior just described. It also indicates the law and economics issues we analyze under each category.

When is each bound likely to come into play? Any general statement will necessarily be incomplete, but some broad generalizations can be offered. First, bounded rationality in the form of judgment errors will come into play whenever actors in the legal system are called upon to assess the probability of an uncertain event. We discuss many examples below, including environmental legislation (Part III.C), negligence determinations (Part IV.A), and risk assessments (Parts IV.B and V.A). Second, bounded rationality as it relates to decision making behavior will come into play whenever actors are valuing outcomes; a prominent example here is loss aversion and its corollary, the endowment effect, which we discuss in connection with bargaining behavior (Part II.B), mandatory contract terms (Part II.D), prior restraints on speech (Part III.B), and risk assessments (Parts IV.B and V.A). Bounded willpower is most relevant when decisions have consequences over time; our example is criminal behavior (Part IV.C), where the benefits are generally immediate and the costs deferred. Finally,

bounded self-interest (as we use the term) is relevant primarily in situations in which one party has deviated substantially from the usual or ordinary conduct under the circumstances; in such circumstances the other party will often be willing to incur financial costs to punish the "unfair" behavior. Our applications here include bargaining behavior (Part II.B) and laws banning market transactions (Part III.A).

The three bounds we describe do not (at least as we characterize them here) constitute a full description of human behavior in all its complexity. Although we will have more to say about parsimony below, we will say for now that our goal is to sketch out an approach spare enough to generate predictions across a range of contexts, but not so spare that its predictions about behavior are often incorrect (as we will suggest is the case with conventional law and economics in some contexts). Many interesting features of behavior not emphasized by our framework may also play a role in explaining specific forms of behavior relevant to law.[14] And it can be illuminating to attend in some detail to the role of social norms in various contexts[15] and to the place of shame, pride, and self-esteem,[16] especially insofar as an understanding of these variables helps give content to people's utility functions in ways that bear on the uses of law. Our principal purpose here, however, is to provide predictions, rather than to give full descriptions of individual motivations and self-understandings, and we will refer to these variables only occasionally and in passing.

B. Testable Predictions

Behavioral and conventional law and economics do not differ solely in their assumptions about human behavior. They also differ, in testable ways, in their predictions about how law (as well as other

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[14] See, e.g., Russell Korobkin & Chris Guthrie, Psychological Barriers to Litigation Settlement: An Experimental Approach, 93 Mich. L. Rev. 107 (1994) (effects of "equity seeking" and "reactive devaluation" on settlement behavior); Mark Kelman, Yuval Rottenstreich, & Amos Tversky, Context-Dependence in Legal Decision Making, 25 J. Legal Stud. 287 (1996) (effects of "compromise" and "contrast" behavior on jury decision making).

[15] See Symposium, 114 U. Pa. L. Rev. 1643 (1996).

[16] See Lawrence Lessig, The Regulation of Social Meaning, 62 U. Chi. L. Rev. 943 (1995).

forces) affects behavior. To make more concrete these differences, consider the three "fundamental propositions of economics" set forth by Richard Posner in his *Economic Analysis of Law*,[17] in a discussion that is, on these points, quite conventional. To what extent would an account based on behavioral law and economics offer different "fundamental propositions"?

The first fundamental proposition for the conventional approach is downward-sloping demand: people demand less of a good when its price rises.[18] This prediction is, of course, valid. There are few if any documented cases of Giffen goods. However, confirmation of this prediction does not suggest that people are optimizing. As Becker has shown, even people choosing at random will tend to consume less of a good when its price goes up as long as they have limited resources.[19] This behavior has also been demonstrated on laboratory rats.[20] Thus, evidence of downward-sloping demand is not evidence in support of optimizing models.

The second fundamental proposition of conventional law and economics concerns the nature of costs: "[c]ost to the economist is 'opportunity cost,'" and "'sunk' (incurred) costs do not affect decisions on prices and quantity."[21] Thus, according to traditional analysis, decision makers will equate opportunity costs (costs incurred by foregoing opportunities—say, the opportunity to sell one's possessions) to out-of-pocket costs (such as costs incurred in buying possessions); and they will ignore sunk costs (costs that cannot be recovered, such as nonrefundable tickets). But each of these propositions is a frequent source of predictive failures. The equality of opportunity costs and out-of-pocket costs implies that, in the absence of important wealth effects, buying prices are roughly equal to selling prices. This is frequently violated, as is well known. Many people holding tickets to a popular sporting event such as the Super Bowl would be unwilling to buy tickets at the market price (say $1000) yet would also be unwilling to sell at this price. Indeed,

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[17] Posner, supra note 6.
[18] Id. at 4.
[19] Gary S. Becker, Irrational Behavior and Economic Theory, 70 J. Pol. Econ. 1 (1962).
[20] John H. Kagel, Raymond C. Battalio, & Leonard Green, Economic Choice Theory: An Experimental Analysis of Animal Behavior 51 (1995).
[21] Posner, supra note 6, at 6, 7.

estimates of the ratio of selling prices to buying prices are often at least two to one, yet the size of the transaction makes it implausible in these studies that wealth effects explain the difference.[22] As described below, these results are just what behavioral analysis suggests. The traditional assumption about sunk costs also generates invalid predictions. Here is one: A theater patron who ignores sunk costs would not take into account the cost of a pre-paid season pass in deciding whether to "rouse [him]self to go out" on the evening of a particular performance;[23] but in a study of theater patrons, some of whom were randomly assigned to receive discounted prices, the patrons who received discounts were found to attend significantly fewer performances than those who did not receive discounts.[24] Thus, sunk costs mattered. Again, the standard prediction proved invalid.

The third fundamental proposition of conventional law and economics is that "resources tend to gravitate toward their most valuable uses" as markets drive out any unexploited profit opportunities.[25] When combined with the notion that opportunity and out-of-pocket costs are equated (see proposition two), this yields the Coase theorem—the idea that initial assignments of entitlements will not affect the ultimate allocation of resources so long as transaction costs are zero.[26] Many economists and economically oriented lawyers think of the Coase theorem as a tautology; if there were really no transactions costs (and no wealth effects), and if an alternative allocation of resources would make some agents better off and none worse off, then of course the agents would move to that allocation. Careful empirical study, however, shows that the Coase theorem is not a tautology; indeed, it can lead to inaccurate predictions.[27] That is, even when transactions costs

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[22] See Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, Experimental Tests of the Endowment Effect and the Coase Theorem, 98 J. Pol. Econ. 1325, 1327 (1990) (summarizing studies).

[23] Robert Nozick, The Nature of Rationality 22 (1993).

[24] Hal R. Arkes & Catherine Blumer, The Psychology of Sunk Cost, 35(1) Organizational Behav. & Human Decision Processes 124 (1985).

[25] Posner, supra note 6, at 11.

[26] Id. at 8; Ronald H. Coase, The Problem of Social Cost, 3 J. L. & Econ. 1 (1960).

[27] Kahneman, Knetsch, & Thaler, supra note 22, at 1329-42.

and wealth effects are known to be zero, initial entitlements alter the final allocation of resources. These results are predicted by behavioral economics, which emphasizes the difference between opportunity and out-of-pocket costs.

Consider the following set of experiments conducted to test the Coase theorem;[28] let us offer an interpretation geared to the particular context of economic analysis of law. The subjects were 44 students taking an advanced undergraduate course in law and economics at Cornell University. Half the students were endowed with tokens. Each student was assigned a token value, the price at which a token could be redeemed for cash at the end of the experiment; these assigned values induce supply and demand curves for the tokens. Markets were conducted for tokens. Those without tokens could buy one, while those with tokens could sell. Those with tokens should (and do) sell their tokens if offered more than their assigned value; those without tokens should (and do) buy tokens if they can get one at a price below their assigned value. These token markets are a complete victory of economic theory. The equilibrium price was always exactly what the theory would predict, and the tokens did in fact flow to those who valued them most.

However, life is generally not about tokens redeemable for cash. Thus another experiment was conducted, identical to the first except that now half the students were given Cornell coffee mugs instead of tokens. Here behavioral analysis generates a prediction distinct from standard economic analysis: Because people do not equate opportunity and out-of-pocket costs for goods whose values are not exogenously defined (as they were in the case of the tokens), those endowed with mugs should be reluctant to part with them even at prices they would not have considered paying to acquire a mug had they not received one. Was this prediction correct? Again markets were conducted and mugs bought and sold. However, unlike the case of the tokens, the assignment of property rights had a pronounced effect on the final allocation of mugs. The students who were assigned mugs had a strong tendency to keep them. Whereas the Coase theorem would have predicted that about half the mugs would trade (since transactions costs had been shown to

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[28] See id.

be essentially zero in the token experiments and mugs were randomly distributed), instead only fifteen percent of the mugs traded. And, those who were endowed with mugs asked more than twice as much to give up a mug than those who didn't get a mug were willing to pay. This result did not change if the markets were repeated. This effect is generally referred to as the "endowment effect"; it is a manifestation of the broader phenomenon of "loss aversion"—the idea that losses are weighted more heavily than gains—which in turn is a central building block of Kahneman and Tversky's prospect theory.

What are we to make of these findings? There are at least three important lessons. First, markets are indeed robust institutions. Even naive subjects participating at low stakes produce outcomes indistinguishable from those predicted by the theory *when trading for tokens*. Second, when agents must determine their own values (as with the mugs), outcomes can diverge substantially from those predicted by economic theory. Third, these departures will not be obvious outside an experiment, even when they exist and have considerable importance. That is, even in the mugs markets, there was trading; there was just not as much trading as the theory would predict. These lessons can be applied to other markets; we offer some examples below.

The foregoing discussion illustrates the point with which we began this section: the difference between conventional and behavioral law and economics is *not* just a difference in the validity of the assumptions about human behavior. While the assumptions of unbounded rationality, willpower, and self-interest are unrealistic, the force of behavioral economics comes from the difference in its predictions (for example, fewer trades for mugs than for tokens). In this sense, our analysis is consistent with the precept originally proposed by Milton Friedman: economics should not be judged on whether the assumptions are realistic or valid, but rather on the quality of its predictions.[29] We share this view; as we have emphasized, our principal interest in this Article is predictive in character. A behavioral analysis would be of much less interest if conventional economic models did a satisfactory job of predicting

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[29] Milton Friedman, The Methodology of Positive Economics, in Essays in Positive Economics 3 (Milton Friedman ed., 1953)

the behavior of agents insofar as relevant to law. Unfortunately, they often do not. Our focus on predictive success means that we generally do not emphasize *why* people tend to exhibit bounded rationality, willpower, and self-interest; this is a fascinating subject on which there is much to be said, but, in light of our predictive focus, we do not give it heavy emphasis here.

C. Partial and Ambiguous Successes of Conventional Economics

What of all the well-known successes of conventional economics? Do they show that predictions about law based on the conventional assumptions tend to work? Consider some [well-worn deleted] examples of the successes: (1) the inverse correlation between price ceilings and queues; (2) the inverse correlation between rent control and the stock of housing; (3) the positive correlation in financial markets between risk and expected return; (4) the relation between futures prices and spot-market prices.[30] The problem with the first three examples is that, as with tests of downward-sloping demand curves, they are quite undemanding; they ask simply whether the theory gets the direction of the effect right—and it does. But this is not a complete vindication of the theory, for the theory may misstate the magnitude of the effect. Consider (3), the positive relation between risk and return in financial markets. As predicted by this theory, stocks (equities) earn higher returns (on average) than do riskless assets such as treasury bills. But what can we say about the magnitude? Is this difference in return about what the theory would predict? This is precisely the question posed asked by Rajnish Mehra and Edward Prescott in their well-known paper on the "equity premium puzzle."[31] The equity premium is the difference in returns between equities and riskless assets. In the United States, the equity premium has been roughly 6 percent over the past 70 years. This implies that a dollar invested in stocks in 1926 would at the end of 1997 be worth over $1800, while a dollar invested in treasury bills would have accumulated to less than $15. This difference is remarkably large. Mehra and Prescott therefore ask whether it can possibly be

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[30] Posner, supra note 6, at 18.

[31] Rajnish Mehra & Edward C. Prescott, The Equity Premium: A Puzzle, 15 J. Monetary Econ. 145 (1985).

explained by investor risk aversion. They conclude that it cannot. That is, no plausible value of risk aversion could explain such a big difference. Although the theory gets the sign right in this case, the magnitude of the effect suggests that the theory is false. (And note that arbitrage, which we discuss just below, would not be expected to eliminate the equity premium.[32])

Example (4) above, the relation between spot and futures prices, does better on magnitudes. Spot and futures prices are very closely related. However, this case is special in several respects. First, arbitrage is possible. If spot and futures prices get out of line, then investors can make sure profits by buying the contract that is too cheap and selling the one that it too expensive. Second, this is a domain where most of the activity is undertaken by professionals who will quickly lose their money and jobs if they make frequent errors. Third, the markets in which these professionals operate offer frequent opportunities for learning. Under these circumstances, markets tend to work very well,[33] though not perfectly.[34] Essentially, these conditions render agents who do not conform to the standard economic assumptions irrelevant.

So, in some (fairly unusual) circumstances, such as futures trading, market forces are strong enough to make the three "bounds" irrelevant for predictive purposes. The point is important; it suggests that while human beings often display bounded rationality, willpower, and self-interest, markets can sometimes lead to behavior consistent with conventional economic assumptions. Then the question becomes when, exactly, do market forces make it reasonable to assume that people behave in accordance with those assumptions? What circumstances apply to most of the domains in which law and

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[32] See Robert Vishny & Andrei Shleifer, Limits of Arbitrage, 52 J. of Fin. 35 (1996); Jeffrey Pontiff, Costly Arbitrage: Evidence from Closed-End Funds," 111 Q. J. Econ. 1135 (1996).

[33] See Thomas Russell & Richard H. Thaler, The Relevance of Quasi Rational Behavior in Competitive Markets, in Richard H. Thaler, Quasi Rational Economics 239, 244-49 (1991).

[34] For example, in a rational market, the relation between spot and futures contracts for foreign exchange are good forecasts of movements in exchange rates. In fact, these forecasts are systematically biased. See Kenneth A. Froot & Richard H. Thaler, Foreign Exchange, in Richard H. Thaler, The Winner's Curse 182 (1992).

economics is applied? In this regard it is instructive to compare the market for futures contracts with the market for criminal activity. Consider the proposition that a potential criminal will commit some crime if the expected gains from the crime exceed its expected costs.[35] Suppose a criminal mistakenly thinks that the expected gains outweigh the expected costs, when in fact the opposite is true. First notice that no arbitrage will be possible in this situation. If someone is unfortunate enough to commit a crime with a negative expected value, then there is no way for anyone else to profit directly from his behavior. Outside of financial markets (and not always there), those who engage in low-payoff activities lose utility but do not create profit opportunities for others. Nor do they typically disappear from the market. (Even poorly run firms can survive for many years; consider GM.) Being a bad criminal is rarely fatal, and except possibly for organized crime, there is little opportunity for "hostile takeovers." Finally, the decision to enter a life of crime is not one that is made repeatedly with many opportunities to learn. Once a teenager has dropped out of high school to become a drug dealer, it is difficult to switch to dentistry.

Since law and economics is frequently applied to criminal behavior, the above argument is obviously germane. However, we think that the same analysis applies to many of the domains in which law and economics has been used. In fact, economic analysis of law seems to be a branch of economics in which the limits of arbitrage are particularly powerful, so special care should be taken not to push the standard economic model too far.

This is by no means to say that conventional law and economics has had no victories. One cannot look at the current state of antitrust law, or the use of market-based regulation in environmental law (to name just two of many examples), without acknowledging the important advances produced through using the conventional approach. Often this approach points in the right directions and identifies flaws in non-economic reasoning. Many advances in the positive and prescriptive understanding of law have come from the conventional assumptions. Attention to incentive effects can often reveal a great deal. (Thus, those who would argue

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[35] See, e.g., Steven Shavell, Criminal Law and the Optimal Use of Nonmonetary Sanctions as a Deterrent, 85 Colum. L. Rev. 1232, 1235 (1985).

that rent control helps tenants must contend with the obvious long-run supply effects of such laws.)

The project of behavioral law and economics, as we see it, is to take the core insights and successes of economics and build upon them by making more realistic assumptions about human behavior. We wish to retain the power of the economist's approach to social science while offering a better description of the behavior of the agents in society and the economy. Behavioral law and economics, in short, offers the potential to be law and economics with a higher "R^2"—that is, greater power to explain the observed data. We will try to highlight some of that potential (and suggest cases where it has been realized) in this Article.

D. Parsimony

A possible objection to our approach is that conventional economics has the advantage of simplicity and parsimony. At least—the objection goes—it provides a theory. By contrast, a behavioral perspective offers a more complicated and unruly picture of human behavior, and perhaps that picture will make predictions harder to make, precisely because it is more complicated and unruly. Everything can be explained in an ex post fashion—some tool will be found that is up to the task—but the elegance, generalizability, and predictive power of the economic method will be lost. Shouldn't analysts proceed with simple tools? We offer two responses: First, simplicity and parsimony are indeed beneficial; it would be highly desirable to come up with a model of behavior that is both simple and right. But conventional economics is not in this position, for its predictions are often wrong. We will encounter many examples in addition to those already discussed.

Second, to the extent conventional economics achieves parsimony, it often does so at the expense of any real predictive power. Its goal is to provide a unitary theory of behavior, a goal which may be impossible to achieve. By itself the notion of "rationality" (the centerpiece of traditional analysis) is not a theory; to generate predictions it must be more fully specified, often through the use of auxiliary assumptions.[36] Indeed, the term "rationality" is highly ambiguous and can be used to mean many things. A person

[36] See Arrow, supra note 11.

might be deemed rational if her behavior (1) conforms to the axioms of expected utility theory; (2) is responsive to incentives, that is, if she changes her behavior when the costs and benefits are altered; (3) is internally consistent; (4) promotes her own welfare; (5) is effective in achieving her goals, whatever the relationship between those goals and her actual welfare. We observe departures from most of these definitions; thus, with respect to (1), departures from expected utility theory have been documented for nearly fifty years, and the quasi rational prospect theory seems to predict behavior better.[37] With respect to (4) and (5), people's decisions sometimes do not promote their welfare or help them to achieve their own goals; and with respect to (3), behavioral research shows that people sometimes behave in an inconsistent manner.[38] Many of our examples will thus show that people are frequently not rational if the term is understood to mean (1), (3), (4), or (5). As for (2), without some specification of what counts as a cost and a benefit, the idea of responsiveness to incentives is empty. If rationality is used to mean simply that people "choose" what they "prefer,"[39] then the notion of rationality offers few restrictions on behavior.[40] The person who drinks castor oil as often as possible is rational because she happens to love castor oil. Other self-destructive behavior (drug addiction, suicide, etc.) can be explained on similar grounds. It is not even clear on this view whether rationality is intended as a definition of "preference" or as a prediction.[41]

If such this notion of rationality allowed for good predictions, then there would be no reason for complaint; the problem, however, is that so high a degree of flexibility leaves the theory with few a priori restrictions. A theory with infinite degrees of freedom is no

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[37] See supra note 11 and accompanying text.

[38] See Amos Tversky, Rational Theory and Constructive Choice, in The Rational Foundations of Economic Behavior (Kenneth Arrow et al. eds 1996).

[39] See, e.g., Richard Posner & Tomas Phillipson, Private Choices and Public Health (1995).

[40] See Arrow, supra note 11, at 204-06.

[41] Thus the idea is ambiguous between the notion of "revealed preferences," in which choices define preferences, and the notion of a maximization function that lies behind and helps explain choices. Both notions have serious problems. See Cass R. Sunstein, Social Norms and Social Roles, 96 Colum. L. Rev. 903, 932-38 (1996).

theory at all. For example, consider whether it is a paradox (as many economists think) if many people vote. If it is a paradox, so much the worse for the rationality assumption; if it is not a paradox, what does the assumption predict? Does it merely predict that people will respond to changes in conditions – for example, fewer people will vote when it is snowing? If so, the prediction is not bad, but surely it would be possible to say, after an unusually large vote amidst the storm, that more people voted simply because voting seemed especially valiant in those circumstances (so much for predictions based on this form of rationality). Conventional economics sometimes turns to stronger forms of rationality in response, and those forms provide stronger predictions in some cases; but those predictions are often inaccurate, as described above and as illustrated by the examples considered below.

We believe that a behavioral approach imposes discipline to economic theorizing because assumptions cannot be imported at will. In a behavioral approach, assumptions about behavior should accord with empirically validated descriptions of actual behavior. Thus, for example, in the case of "fairness," specifically defined and empirically verified patterns of behavior are used to generate predictions in new contexts. ("Fairness" is not, on this view, simply a catch-all to explain any observed behavior.) This is the approach we advocate for economic analysis of law. This approach, we believe, produces a better understanding of law and a better set of predictions about its effects.

We now turn to positive, prescriptive, and normative issues. Our purpose is not to settle all of them, but to show the promise of behavioral economics in casting light on a wide range of questions. A great deal of work would be necessary to justify authoritative judgments on most of these questions. What follows should be taken partly as a proposal, perhaps in the spirit of the early economic analysis of law, for a research agenda to be carried out with a new set of tools.

II. Behavior of Agents

A. The Ultimatum Game

1. The Game and Its Sunk-Cost Variation

We begin with bounded self-interest, the third bound described above. A useful first example of this bound is agents' behavior in a very simple bargaining game called the ultimatum game. In this game, one player, the Proposer, is asked to propose an allocation of a sum of money between herself and the other player, the Responder. The Responder then has a choice. He can either accept the amount offered to him by the Proposer, leaving the rest to the Proposer, or he can reject the offer, in which case both players get nothing. Neither player knows the identity of his or her counterpart, and the players will play against each other only once, so reputations and future retaliation are eliminated as factors.

Economic theory has a simple prediction about this game. The Proposer will offer the smallest unit of currency available, say a penny, and the Responder will accept, since a penny is better than nothing. This turns out to be a very bad prediction about how the game is actually played. Responders typically reject offers of less than twenty percent of the total amount available; the average minimum amount that Responders say they would accept is between twenty and thirty percent of that sum.[42] Responders are thus willing to punish unfair behavior, even at a financial cost to themselves. This is a form of bounded self-interest. And it seems to be expected and anticipated by Proposers; they typically offer a substantial portion of the sum to be divided—ordinarily forty to fifty percent.[43]

Economists often worry that the results of this type of experiment are sensitive to the way in which the experiment was conducted. What would happen if the stakes were raised substantially, or the game was repeated several times to allow

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[42] Werner Guth, Rolf Schmittberger, & Bernd Schwarze, An Experimental Analysis of Ultimatum Bargaining, 3 J. Econ. Behav. & Organization 379 (Table 7) (1982); Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, Fairness and the Assumptions of Economics, 59 J. Business S285, S291 (Table 2) (1986).

[43] Guth, Schmittberger, & Schwarze, supra note 42, at 375, 379 (Tables 4, 5, 7); Kahneman, Knetsch, & Thaler, supra note 22, at S292 (Table 2).

learning? In this case, we know the answer. To a first approximation, neither of these factors changes the results in any important way. Raising the stakes from $10 per pair to $100, or even to several months' income (in a poor country) has little effect; the same is true of repeating the game ten times with different partners.[44] (Of course, at some point raising the stakes would matter; probably few people would turn down an offer of five percent of $1,000,000.) We do not see behavior moving toward the prediction of standard economic theory.

Thus, the factors that many economists thought would change the outcome of the game did not. But, as we learned in a study conducted for this paper, a factor that economic theory predicts will *not* have an effect, namely the introduction of a sunk cost, does have an effect. As noted above, economics predicts that decision makers will ignore sunk costs in making their choices (see fundamental proposition two above); but in fact decision makers often do not behave in this way. Do sunk costs alter behavior in the ultimatum game? To find out, we asked classroom volunteers to bring $5—what would become a sunk cost for them—to class. Students were given a form asking them how they would play both roles in an ultimatum game in which the $10 to be divided was contributed half by the Proposer and half by the Responder. They were told that their role would be determined by chance, so they had to decide first what offer to make if they were chosen to be a Proposer and then what minimum offer they would be willing to accept if they were in the role of the Responder.[45] We also ran a version of the standard ultimatum game (without sunk costs by the students) as a control.

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[44] Colin Camerer & Richard H. Thaler, Anomalies: Ultimatums, Dictators, and Manners, 9 J. Econ. Perspectives 209, 210-11 (1995); Robert Slonim & Alvin Roth, Financial Incentives and Learning in Ultimatum Games: An Experiment in the Slovak Republic, ___ Econometrica ___ (forthcoming 1998); Vesna Prasniker & Alvin E. Roth, Considerations of Fairness and Strategy: Experimental Data from Sequential Games, 107 Q. J. Econ. 865, 874, 879 (1992).

[45] This experiment is profitable for the experimenter if any offers are rejected by Responders (because the experimenter has collected $10 from each pair of bargainers, which the bargainers forfeit if the Proposer's offer is rejected). To solve this "problem," we conducted another experiment right after in which the winner of a game was awarded any profits earned by the experimenter in the first round.

Although economic theory says that the sunk-cost variation of the ultimatum game will have no effect on behavior (since the $5 collected from each student is a sunk cost and should therefore be ignored), we predicted that in this domain sunk costs would matter. In particular, we anticipated that Responders would feel that they had an "entitlement" to the $5 they had contributed to the experiment and would therefore be reluctant to accept less. This is precisely what we found. In the original version of the game, when the $10 to be divided was provided to subjects by the experimenter, the average minimum amount demanded by Responders was $1.94. In the sunk-cost version, where the students each paid $5 to participate, the average demand was $3.21 for a group of MIT MBA students, $3.73 for a group of University of Chicago MBA students, and $3.35 for a group of UC Law students. Each of these means is significantly different from the control value of $1.94 under any conventional measure of statistical significance. Looking past means, 61% of the MIT students demanded at least $4.00 and 32% demanded a full refund of their $5.00. For UC MBA students, 67% demanded at least $4.00 and 40% demanded $5.00. The UC Law students were slightly less extreme: 47% demanded at least $4.00 and 23% demanded $5.00.

Note that our emphasis here, as well as in the ordinary ultimatum game, is on the fairness behavior of Responders, not on affirmative concerns for fairness on the part of Proposers. (As noted above, their behavior appears fully consistent with financially maximizing responses to Responders' fairness behavior; other experimental results support this conclusion.[46]) We do know, however, that in other contexts people appear to display affirmative concerns for fairness.[47]

The fairness results obtained in various experimental settings, such as the ultimatum game, cannot be explained on grounds of reputation. The parties are interacting anonymously and in a one-shot fashion. Of course, many real-world situations may reflect a combination of reputational and fairness factors. Thus, for example,

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[46] See Elizabeth Hoffman et al., Social Distance and Other-Regarding Behavior in Dictator Games, 86 Am. Econ. Rev. 653 (1996).

[47] See Ernst Fehr et al., Does Fairness Prevent Market Clearing, 108 Q. J. Econ. 437 (1993).

firms that violate the norms of an industry are ostracized, presumably at some cost to the remaining firms, partly because of a rational fear that the offending party might be untrustworthy, and partly because of a spiteful tendency to punish unmannerly behavior, even when the punishment is costly to administer (as when Responders turn down small offers). Many of Robert Ellickson's examples in his pathbreaking book, *Order Without Law*, have precisely this flavor.[48] Often it is impossible to disentangle the two effects. The value of the experimental method is precisely that situations can be created in which the reputational factor is absent (because the transactions are anonymous and one-shot), allowing one to test directly for fairness. The ultimatum game results show that we find it: people will often behave in accordance with fairness considerations even when it is against their financial self interest *and no one will know*. Thus, for instance, most people leave tips in out-of-town restaurants that they never plan to visit again.

2. Fairness, Acrimony, and Scruples

(a) Theoretical considerations

How can economic analysis be enriched to incorporate the behavior observed in the ultimatum game and its sunk-cost variant? As we have indicated, the first step is to relax the assumption, common to most economic theorizing, of "unbounded self-interest." This assumption implies that Proposers should offer the smallest sum possible, and Responders should accept. An alternative view is offered in the following account: "In the rural areas around Ithaca it is common for farmers to put some fresh produce on a table by the side of the road. There is a cash box on the table, and customers are expected to put money in the box in return for the vegetables they take. The box has just a small slit, so money can only be put in, not taken out. Also, the box is attached to the table, so no one can (easily) make off with the money. We think that the farmers who use this system have just about the right model of human nature. They feel that enough people will volunteer to pay for the fresh corn

[48] Robert C. Ellickson, Order Without Law (1991).

to make it worthwhile to put it out there. The farmers also know that if it were easy to take the money, someone would."[49]

We emphasize that this is not a story of simple altruism. Such altruism is sometimes recognized in conventional economics.[50] Our account, in contrast, is a more complicated story of reciprocal fairness. A concern for fairness is part of most agents' utility function. The ultimatum game results, like the behavior of the Ithaca shoppers, cannot readily be explained on grounds of simple altruism. First of all, the games are played between anonymous strangers. What reason is there to believe that these people care about one another? (Most of us give little of our wealth to anonymous strangers whom we have no reason to believe are any worse off than we are. Similarly, most people driving by a farm do not pull over and stuff two dollars through the mail slot, even in Ithaca. Fairness behavior is probably reciprocal.) Second, we observe not only apparently "nice" behavior (generous offers) but also "spiteful" behavior (Responders turning down small offers at substantial cost to the Proposers). In this game, people appear simultaneously nicer and more spiteful than conventional assumptions predict.

It is also no answer to say that the results of the ultimatum game are readily predictable on the conventional model on the ground that pride and self-conception are part of players' utility functions. The problem with this view is not that it is false but that it allows ad hoc, ex post additions to the utility function, in such a way as to deprive the conventional model of the ability to make any predictions; the goal of the behavioral approach is to go back and forth between data and theory to generate predictions that will generalize.

The sort of balanced conception of human nature suggested by the ultimatum game results and the practices of farmers in Ithaca need not be informal or ad hoc. It is possible to incorporate material and non-material motives, such as the desire to be fair (to those who

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[49] Robyn Dawes & Richard H. Thaler, Cooperation, in Richard H. Thaler, The Winner's Curse 20 (1992).

[50] Gary Bolton, A Comparative Model of Bargaining, 81 Am. Econ. Rev. 1096 (1991); Jack Ochs & Alvin E. Roth, An Experimental Study of Sequential Bargaining, 79 Am. Econ. Rev. 355 (1989).

have been fair) and also to be spiteful (to those who have not been fair). An elegant formal treatment is offered by Matthew Rabin in a model of fairness.[51] Rabin's framework incorporates three stylized facts about behavior. Stated simply and non-formally:

> (1) People are willing to sacrifice their own material well-being to help those who are being kind.
> (2) People are willing to sacrifice their own material well-being to punish those who are being unkind.
> (3) Both motivations (1) and (2) have greater effect on behavior as the material cost of sacrificing becomes smaller.[52]

Rabin shows how these assumptions about behavior can explain the behavior observed in the ultimatum game as well as other games of cooperation such as the Prisoner's Dilemma. Related work, bearing on the appropriate role of law, has shown the role of such behavior in helping to produce norms that solve collective action problems.[53]

Rabin's theory can be viewed as a theory of manners and principles. Generalizing from Rabin's treatment, we might say that people can be understood as having preferences for (a) their own material payoffs and (b) those of some others they know well, and in addition they have preferences about (c) the well-being of some strangers whose interests are at stake, (d) their own reputation, and (e) what kind of person they wish to be. A person's willingness to cooperate or to help others can be seen as a function of these variables. The last factor is important and especially easy to overlook; the desire to think of yourself as an honest, principled person helps explain why most of us (though not all) do leave tips in strange restaurants, and would leave money in the box at the road-side stand. As Rabin says, people are willing to sacrifice their own material well-being to help those who are being or have been kind. Of course, these desires compete with others in a world of scarce

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[51] Matthew Rabin, Incorporating Fairness into Game Theory and Economics, 83 Am. Econ. Rev. 1281 (1993).
[52] Id. at 1282.
[53] See Robert Axelrod, The Emergence of Cooperation (1984); Robert Axelrod, Complexity and Cooperation (1997).

resources. We don't recommend that Mercedes dealers adopt the road-side stand selling technique.

Thus behavioral economic agents have manners and scruples that can lead them to be "nice" in some settings. But, as we observe in the ultimatum game, people can also be provoked to be spiteful. Sometimes the fact that another person will lose, in a material or other sense, is a benefit to the agent; these are the conditions for spite. An agent may calculate that the costs of benefiting another person argue strongly against a deal, even if the agent would benefit materially. Thus Responders who receive (relatively) small offers are willing to decline them in order to punish the rude Proposers who tried to grab too much for themselves, even when the small offer is a substantial amount of money. Notice that this spiteful behavior is also "principled": people are willing to pay to punish someone who has been unfair. This is the same behavior that drives boycotts, where consumers refrain from buying something they normally enjoy in order to punish an offending party. Conventional economics has sometimes recognized such behavior, but it has received little attention in law and economics, where, unfortunately, it may often be quite relevant.[54]

Spiteful behavior is common under conditions of acrimony, such as during a fight or argument. Under these circumstances, even married couples will say and do things to hurt the other party; under bad conditions, the hurting, material or otherwise, is part of the agent's gain. A loss to another is a gain to oneself; even the idea of thinking of oneself as a certain kind of person (not a doormat or a dupe) can lead in the direction of inflicting losses. (Concern with not establishing a reputation as a doormat or a dupe may also play a role.) This is of course the converse of circumstances of cooperative behavior. Unfortunately, acrimony is particularly prevalent in many legal settings, before, during, and after litigation. Much protracted litigation—cases that fail to settle early and amicably—may arise precisely because the two sides were unable to deal with matters in a more friendly manner. (Divorces that end up in court are, almost by definition, acrimonious.) We suspect that spiteful behavior is frequently observed in conditions of acrimony even when

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[54] The concept of revenge, which is related to spite, has been discussed in the law and economics literature.

reputational concerns are unimportant; for example, we think that the average contestant in a divorce case that ends up in court would be likely, in the role of Responder in the ultimatum game playing against his soon-to-be-ex-spouse, to reject low offers, not wanting the Proposer to benefit greatly.[55]

(b) What is "fair"?

Absent acrimony, spiteful behavior—such as rejection of small offers in the ultimatum game—is typically observed in situations where one party has violated a perceived "norm of fairness." This raises an obvious question: What is "fair"? In the ultimatum game, most people regard an offer of, say, a penny to the Responder as "unfair." This perception is an illustration of a more general pattern: people judge outcomes to be "unfair" if they depart substantially from the terms of a "reference transaction"—a transaction that defines the benchmark for the parties' interactions.[56] When the interactions are between bargainers dividing a sum of money to which neither is more entitled than the other (and this is common knowledge), the "reference transaction" is something like an equal split; substantial departures are viewed as unfair and, accordingly, punished by Responders. If parties are bargaining over the division of money and both have reason to view one side as more entitled than the other, then the "reference transaction" is a split that favors the more-entitled party.[57] And if the parties are a consumer and a firm in the market, the "reference transaction" is a transaction on the usual terms for the item in question.[58] We will have much more to say about this last context in Part III below. For now our goal is simply to offer our general definition of what is "fair" and to make clear that we do not view the term as a vague and ill-defined catch-all.

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[55] Cf. Robert Gibbons & Leaf Van Bonen, Multiple Selves in the Prisoners' Dilemma (working paper, Cornell University, 1998) (subjects more like to engage in cooperative behavior in games when they have a positive impression of their opponent than when they have a negative impression).

[56] Daniel Kahneman, Jack L. Knetsch, & Richard H. Thaler, Fairness as a Constraint on Profit Seeking: Entitlements in the Market, 76 Am. Econ. Rev. 728 (1986).

[57] Elizabeth Hoffman & Matthew Spitzer, Entitlements, Rights, and Fairness: An Experimental Examination of Subjects' Concepts of Distributive Justice, 14 J. Legal Stud. 259 (1985).

[58] Kahneman, Knetsch, & Thaler, supra note 56.

Rather, we view it as having a reasonably well-specified meaning that can generate useful predictions across a range of contexts.[59]

(c) Norms

Norms. Thus far the discussion has emphasized fairness, and we will stress this factor throughout. But fairness-related norms are a subset of a large category of norms that govern behavior, and that can operate as "taxes" or "subsidies." An analysis like that in Part II(A)(2)(a) above could be undertaken for many decisions in which people care not only about material self-interest but also about their reputations and their self-conception—for example, through purchasing books, suits, vacation spots, or through smoking, recycling, discriminating on the basis of race and sex, or through choosing friends, restaurants, and automobiles. A better understanding of the ingredients of individual utility could help a great deal with both the positive and prescriptive analysis of law. For example, it might help us understand more about the massive changes in behavior that have followed largely unenforced bans on smoking in public places—the phenomenon of "compliance without enforcement."[60]

B. Bargaining Around Court Orders

1. Coasian Prediction

As noted above, an important aspect of law and economics is the Coase theorem, which says that the assignment of a legal entitlement will not influence the ultimate allocation of that entitlement when transaction costs and wealth effects are zero. A straightforward application of this idea is that when a court enters a judgment, whether in the form of an injunction or a damage award, the parties are likely to bargain to a different outcome if that

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[59] For a recent effort to incorporate a more general notion of "fairness" into the economic analysis of tort law, see Henrik Lando, An Attempt to Incorporate Fairness into an Economic Model of Tort Law, 17 Int'l Rev. L. & Econ. 575 (1997). The relevant "fairness" notions there may be somewhat more "ad hoc," as Henrik ultimately concludes, id. at 582, because, in contrast to the more market-oriented contexts we consider, there is no clear "reference transaction" in the tort context.

[60] See Compliance Without Enforcement, in Smoking Policy (Robert Rabin and Stephen Sugarman, eds., 1993).

outcome is preferable to what the court did and the transaction costs and wealth effects are small. (Thus, for instance, if the court enters a prohibitively high damage award but the activity in question is efficient, the parties should bargain for a lower damage level.)[61] To whom an entitlement is allocated after litigation, and how it is protected (by a property rule or a liability rule), are irrelevant to the ultimate allocation of the entitlement in these circumstances.

2. Behavioral Analysis

Influenced by behavioral economics, many legal commentators have observed that in light of the endowment effect described in Part I (an aspect of prospect theory, and thus an instance of bounded rationality), the assignment of a legal entitlement may well affect the outcome of bargaining, even when transaction costs (as conventionally defined) and wealth effects are zero.[62] This conclusion is suggested by the mugs experiments described in Part I, as well as by a substantial body of other evidence on the endowment effect.[63] The mugs results were obtained in circumstances that were the most favorable for the predictions of the conventional theory to hold. Transactions costs were zero and the sort of emotional attachments that can grow over time in the real world were absent. Mug owners had become mug owners just minutes before the markets were run. Compare that with a homeowner who has been endowed with the right to have her homestead protected from noxious fumes being emitted nearby.

Although the endowment effect suggests generally that the assignment of a legal entitlement may affect the outcome of bargaining, such an effect is especially likely when the entitlement is in the form of a court order obtained after legal proceedings between opposing parties (our focus here). This is so for several reasons.

First, the process of going through litigation may strengthen the endowment effect. Experimental evidence suggests that there is an

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[61] See, e.g., Louis Kaplow & Steven Shavell, Property Rules Versus Liability Rules: An Economic Analysis, 109 Harv. L. Rev. 713, 733-34 (1996).

[62] See, e.g., Elizabeth Hoffman & Matthew L. Spitzer, Willingness to Pay vs. Willingness to Accept: Legal and Economic Implications, 71 Wash. U. L. Q. 59, 99 (1993); Kelman, supra note 56.

[63] See Kahneman, Knetsch, & Thaler, supra note 22, at 1327 (listing 12 prior studies finding evidence of the endowment effect).

especially strong endowment effect when a party believes that he has earned the entitlement or that he particularly deserves it.[64] Of course someone who has received a court judgment in his favor will believe that he has earned it. Such a person may also believe strongly that this outcome is fair, based on the self-serving bias discussed in the following section.

Bounded self-interest, and specifically the acrimony notions developed above, provide an additional reason we might expect less bargaining in real world settings than in law and economics texts. Even if there are financial gains from making a deal, it is difficult to bargain without communication, and litigants are often not on speaking terms by the end of a protracted trial. Even if communication is possible, bargains are unlikely to be struck when both sides take pleasure in making the other side worse off; in such circumstances it can be difficult to reach even settlements that would substantially improve the lot of both parties. For all of these reasons, behavioral research suggests that injunctions and damage awards may stick even with low transaction costs (as conventionally defined).

Note that another way of phrasing this conclusion is that the concept of transaction costs is broader than conventional analysis assumes. The costs of a transaction include not only the conventionally recognized ones (for example, the cost of assembling all of the relevant parties), but also costs such as the discomfort or displeasure of dealing with an adversary. If "transaction costs" are defined in this broader way, then, for the reasons given above, they will very often be substantial in the case of bargaining around court orders; hence, deals are unlikely to occur. This observation illustrates an important general point. Once the behavioral analysis is understood, it can often be incorporated into economic analyses using standard concepts such as transactions costs. This should not be taken to imply, however, that the behavioral analysis is superfluous. Under the usual account, transactions costs would have been assumed to be zero as long as the two sides could easily negotiate.

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[64] George Loewenstein & Sam Issacharoff, Source-Dependence in the Valuation of Objects, 7 J. Behav. Decision Making 157 (1994).

It is of course true that most cases settle, so that those which do not, and which thus produce court orders, may be atypical in some respects. But that does not mean they are unimportant objects of study for purposes of positive analysis. With conventional law and economics, behavioral analysis is concerned with the fact (and the consequences of the fact) that some cases proceed to trial.[65]

Although our focus in this section is on positive analysis, there is also a tricky underlying normative issue: When people fail to reach bargains that would be reached in the absence of endowment effects and spiteful behavior in conditions of acrimony, is there any problem from the standpoint of efficiency? On one view, the answer is no; if the parties do not contract around a court-ordered outcome for these reasons, then the outcome must be efficient (even if another, different outcome—favoring the other side—would also have been efficient). An underlying question, however, is whether spite ought to count in the efficiency calculus. Some (although certainly not all) of the most prominent utilitarian philosophers believe that it should not.[66]

3. Evidence

Conventional economic theory and behavioral analysis thus generate distinct predictions about what happens after trials. These theories can therefore be tested with empirical evidence. What happens once a court judgment has been entered? How often do the parties bargain to a different outcome? Consider the set of cases where the court has assigned an entitlement to the party who values it less. In these circumstances, the standard theory would predict contracting around the court order whenever transactions costs (as conventionally defined) and wealth effects are small. (The possibility

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[65] Conventional law and economics attributes failures to settle primarily to informational differences among parties. There is a large literature on this topic, which is well summarized in Bruce L. Hay & Kathryn E. Spier, Litigation and Settlement, The New Palgrave Dictionary of Economics and the Law (forthcoming).

[66] See John C. Harsany, Morality and the Theory of Rational Behavior, in Utilitarianism: For and Against 39, 55-56 (A. Sen & B. Williams eds. 1982). A. Mitchell Polinsky and Steven Shavell have acknowledged this view in their analysis of punitive damages as a response to the socially illicit gains obtained by certain defendants. See A. Mitchell Polinsky & Steven Shavell, Punitive Damages: An Economic Analysis, 111 Harv. L. Rev. 869, 908-10 (1998).

of asymmetric information is discussed below in connection with the existing empirical findings.) The behavioral theory predicts that even in such cases, there will often be no recontracting. Since it is unlikely that court orders are, across the board, uniquely efficient, it should be possible to test these differing predictions.

Even without this detailed type of information, data gathered by Ward Farnsworth suggest that there is much less post-trial bargaining than the economic model would predict.[67] Farnsworth interviewed attorneys from approximately twenty nuisance cases in which injunctive relief was sought and either granted or denied after full litigation before a judge. In not a single case of those Farnsworth studied did parties even attempt to contract around the court order, even when transactions costs were low, and even when an objective third party might think that there was considerable room for mutually advantageous deals. Conventional analysis might attribute failures to reach an ultimate agreement to asymmetric information;[68] but under such analysis it is difficult to explain the complete failure even to negotiate. It is also interesting to note that the lawyers interviewed said that the parties would not have reached a contractual solution if the opposite result had been reached. (This last point also means that the no-bargaining result cannot be explained by supposing that the court orders entered were uniquely efficient.)

The lawyers' explanations for these results are behavioral in character. Once people have received a court judgment, they are unwilling to negotiate with the opposing party, partly because of an unwillingness by victorious plaintiffs to confer advantages upon their opponents. Having invested a great deal of resources in pursuing the case all the way to court and through a trial, victors perceive themselves as having a special right to the legally endorsed status quo, and they are unlikely to give that right up, especially to their opponent, for all, or most, of the tea in China. Their investment in the entitlement gives it a distinctive character. Bargains are unlikely in the extreme; they tend not even to occur to the plaintiff or the defendant.

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[67] Ward Farnsworth, Do Parties to Nuisance Lawsuits Bargain After Judgment? A Glimpse Inside the Cathedral (working paper 1998).

[68] See e.g., Kaplow & Shavell, supra note 66, at 734-37.

Here, as elsewhere in this Article, our emphasis is on whether empirical evidence exists to test the predictions of the conventional and behavioral economic accounts, and, if more evidence would be helpful, what sort of study might be most useful. It is frequently remarked that law and economics is primarily theoretical or analytic, and rarely empirical. Victory is often declared based on a dataless model. We think that before victory can be declared for either conventional or behavioral law and economics, the fit of the theory with the available evidence must be assessed. For behavioral analysis, it is not enough to build a model consistent with behavior observed in an experimental setting (such as behavior in the ultimatum game or the mugs experiments); the model must be compared and tested against what we observe in the world. A good aspiration for both conventional and behavioral approaches is careful empirical work that provides reasonably definitive conclusions about predictive failures and successes.

The empirical data and future empirical research discussed in this section concern behavior after a court has entered a judgment. Of course, most cases settle before trial, and so it is also important to ask to what degree bargaining is likely to be successful prior to this point. This is a separate question; bargaining may be more likely in that setting because neither side has yet been endowed through a court judgment with a clear entitlement. On the other hand, self-serving bias and conditions of acrimony (as well as the background force of the "ordinary" endowment effect) may still preclude successful bargaining. The next section examines the effect of self-serving bias on successful pretrial bargaining (as well as other forms of bargaining) in more detail.

C. Failed Negotiations

1. Self-Serving Conceptions of Fairness

Even among the well-mannered, fair-minded agents that populate behavioral economics, self-interest is very much alive and well. For often there will be room for disagreement about what is fair (or, equivalently, what is the appropriate reference transaction)—and thus there will be the opportunity for manipulation by self-interested parties. These parties may tend to see things in the light most favorable to them—as, for example, when

members of a couple asked to estimate their contribution to household tasks give sums that significantly exceed 100%.[69] While people care about fairness, their assessments of fairness are distorted by their own self-interest. This is a form of bounded rationality—specifically, a judgment error; people's perceptions are distorted by self-serving bias.

This form of bias can help to explain the frequency of failed negotiations. It is quite common, in cases involving divorce, child custody, and even commercial disputes, to see protracted litigation in circumstances in which it might be expected that the parties would be able to reach negotiated solutions (although it of course remains the case that most cases settle). On the standard account, the existence of such protracted litigation is a significant puzzle. With a good sense of the expected value of suit, parties should settle more than they do. It may be possible to explain some of the observed behavior in terms of asymmetric information and signaling, which may interfere with settlement prospects.[70] However, this account is difficult to test. By contrast, the effects of self-serving bias in negotiations have been tested empirically, as described below.

2. Evidence

The leading study in this area is one by Linda Babcock, Xianghong Wang, and George Loewenstein on the consequences of self-serving bias for negotiation impasse in public school teacher contract negotiations in Pennsylvania.[71] A common element of public sector labor negotiations is for both sides to invoke agreements in "comparable" communities, either as a measure of market conditions or as a characterization of what is fair. Do participants in a negotiation choose comparable communities in a rational manner? Babcock, Wang, and Loewenstein hypothesized that they may not; instead, both sides may adopt self-serving judgments about which communities are "comparable," and impasses may result from such judgments. They designed a survey of union and school board presidents in all school districts in Pennsylvania, in

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[69] Ross & Sicoly, Egocentric Biases in Availability and Attribution, 37 J. Personality & Social Psychol. 322 (1979).

[70] See, e.g., Polinsky, supra note 5, at 109-111.

[71] Linda Babcock, Xianghong Wang, & George Loewenstein, Choosing the Wrong Pond, 111 Q. J. Econ. 1 (1996).

order to elicit judgments about comparable districts for purposes of salary negotiations. Respondents were asked to "list the districts they felt were comparable to their own." Note that there is no strategic incentive here to misrepresent one's view of which districts are comparable, either to gain an advantage in negotiations or to curry public favor for one's negotiating position; the only audience for the responses in the study was the study's authors. Nonetheless, substantial differences between the two sides emerged. The average salary listed by union presidents for comparable districts was $27,633, compared to an average of $26,922 for school board presidents. This difference was about 2.4% of average teacher salary during a time when salary increases averaged below 5% per year.

By itself this difference is highly suggestive; if the two sides have different views about comparable districts, bargaining impasses may well occur. But do these self-serving views (reported to the authors of the study in response to a survey question) correlate with actual behavior? Yes. The authors regressed the percentage of previous negotiations that ended in a strike against the difference between the two sides' lists of comparable districts. The regression showed that this difference had substantial explanatory power. In those school districts where the average salary of the union's list is $1000 greater than the board's list, a strike is 49% more likely than where the average salaries of the two lists are the same. Thus self-serving biases can explain real-world bargaining impasses.

As already noted, strategic behavior does not seem to provide a strong explanation for the empirical evidence on school-district negotiations. There was no incentive in the study (as there would often be in negotiations with the opposing party [deletion of asymmetric information reference]) for parties to choose comparable districts in a strategic manner.[72] The behavioral account seems to exhibit a higher "R^2"—a better ability to predict the observed data—than the standard account.

A fertile ground for future study of self-serving bias and its relationship to bargaining impasse may be negotiations between baseball players' agents and team management. It is common

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[72] For a fuller discussion than space here permits of the possibility of strategic behavior, and experimental evidence from other studies that points against such an explanation for the results, see id. at 17-18.

practice in these negotiations for both sides to use the contracts of "comparable" players as reference points, once again as a measure of market conditions and as a characterization of what is fair. Participants' selection of which players are comparable may well be colored by self-serving bias. Exploration of the impact of this behavioral factor on the success or failure of these negotiations seems far more promising than examining the role of informational asymmetry in this setting. For the participants have equal access to the information that defines what is a comparable player. Thus behavioral economics appears far more likely than the conventional model to predict and account for those negotiations that fail and end up in the hands of an arbitrator.

In addition to the existing data on school district strikes, researchers have conducted experimental studies on the role of self-serving bias in preventing negotiated agreements.[73] The studies involved a tort case based on real litigation in Texas. Subjects—college and law students—were randomly assigned to the role of plaintiff or defendant; in this role they were asked to negotiate a settlement. They received a short summary of the case and also twenty-seven pages of materials from the original case. Subjects were told that the same case materials had been given to a judge in Texas, who had reached a judgment between $0 and $100,000. Before beginning to negotiate, subjects were asked to write down their guesses about what the judge awarded. They were also asked to say what they considered a fair amount for the plaintiff to receive in a settlement. The authors found quite substantial self-serving biases in subjects' assessments of the judge's award. The subjects acting as the plaintiffs guessed an average $14,527 higher than the defendants', and the plaintiffs' fair settlement values averaged $17,709 higher than those of the defendants. Nonsettlement was strongly connected to the discrepancy in predictions about the judge's likely award. Note that the hypothetical, role-playing nature of this study in some ways strengthens the interpretation of the result. In the short time that it

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[73] Linda Babcock, George Loewenstein, Samuel Issacharoff, & Colin Camerer, 85 Am. Econ. Rev. 1337 (1995); George Loewenstein, Samuel Isaacharoff, Colin Camerer, & Linda Babcock, Self-Serving Assessments of Fairness and Pretrial Bargaining, 22 J. Legal Stud. 135 (1993).

took to read all the materials, subjects adopted the point of view of roles and the bias that comes with it. Of course, the fact that roles were only hypothetical, and the financial stakes small, means that we cannot be sure from these studies alone that parties would display self-serving bias in real-world settings; but the school-district study shows the importance of the bias in such settings.

3. The Role of Lawyers

Are real lawyers immune from self-serving biases? It is possible to overcome a bias if there are numerous opportunities for learning. Indeed, there is some evidence that lawyers, as intermediators, are relatively less subject to self-serving bias, in a way that can help promote settlement.[74] However, there is suggestive evidence that self-serving bias can affect lawyers and judges as well. A study of 205 experienced bankruptcy lawyers and 150 bankruptcy judges found self-serving biases in responses to a wide range of questions involving how long it takes judges to rule on fee applications, the fairness of fees, and lawyers' fee awards in general.[75] Thus, for example, thirty-two percent of lawyers report that they never request court-ordered compensation in excess of normal hourly rates, but judges report that only eleven percent of lawyers never make such requests.[76] This evidence does not show that lawyers do not reduce self-serving bias in actual litigation, but it casts doubt on the proposition that this bias is eliminated by the involvement of professionals. To the extent that the bias is reduced through lawyers' involvement, it suggests that part of the appropriate role of lawyers may be to counter their clients' predictable inclination to overstate the fairness of their own cause. This may be difficult since clients are the ultimate decision makers and lawyers may have an economic interest in not settling. Thus serious ethical issues may arise about the lawyer's obligations. To the extent that debiasing by lawyers is a possibility, behavioral research provides considerable guidance on which debiasing

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[74] Russell Korobkin & Chris Guthrie, Psychology, Economics, and Settlement: A New Look at the Role of the Lawyer, 76 Tex. L. Rev. 77 (1997).

[75] Theodore Eisenberg, Differing Perceptions of Attorney Fees in Bankruptcy Cases, 72 Washington U. L. Q. 979 (1994).

[76] Id. at 988.

techniques are least likely to be successful, and which might actually work.[77]

D. Mandatory Contract Terms

1. Wage and Price Effects.

One of the most frequent claims in the economic analysis of law is that the imposition of mandatory terms on parties to a contract will make both parties to the contract worse off; it will operate as an effective tax on their transaction. Thus, for example, rules granting employees a particular level of workplace safety, or tenants the right to a habitable apartment, will make employers and employees, or landlords and tenants, worse off.[78] In this section, we suggest that bounded rationality, in particular the endowment effect, casts doubt on the conventional law and economics claim.

The conventional argument against mandatory contract terms such as those just mentioned has two steps. First, since the parties did not bargain for the term in question when left to their own devices, the cost of the term must exceed its benefit (otherwise they would have agreed to it on their own). Thus, for example, if a particular employment benefit is worth $100 per year to employees and costs the employer only $90 to provide, a mandate should not be necessary; but if we do not observe the parties agreeing to the benefit on their own, then the cost must exceed $100. The second step in the conventional argument is that imposing a mandatory term in these circumstances will operate as a tax on the parties, causing the wage to fall (or, in the case of a habitable apartment, the price to rise) by somewhere between the benefit and the cost of the term, and causing the number of profitable trades to fall.[79] Thus, in the example just given, if the cost of the benefit valued at $100 is $110,

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[77] See Linda Babcock, George Loewenstein, and Samuel Issacharoff, Debiasing Litigation Impasse, ___ J. L. Soc. Inq. ___ (forthcoming).

[78] Posner, supra note x, at 363, 515-16; Richard A. Epstein, In Defense of the Contract at Will, 51 U. Chi. L. Rev. 947, 954-55 (1984); Charles J. Meyers, The Covenant of Habitability and the American Law Institute, 27 Stanford L. Rev. 879, 890 (1975); Edward H. Rabin, The Revolution in Residential Landlord-Tenant Law: Causes and Consequences, 69 Cornell L. Rev. 517, 558 (1984).

[79] See, e.g., Lawrence H. Summers, Some Simple Economics of Mandated Benefits, 79 Am. Econ. Rev. Pap. & Proc. 177, 180 (1989).

then the employer will reduce the wage rate by somewhere between $100 (the value of the benefit to employees) and $110 (the cost of the benefit); and the level of employment will fall. This analysis assumes an upward-sloping (not vertical) labor supply curve, but, at least for the worker group discussed below in connection with the existing empirical evidence (female employees), this assumption is clearly reasonable.[80]

The conventional account thus offers sharp predictions about the effects of imposing mandatory contract terms. Do the data bear out these predictions? The leading study in this area is a study of the effects of imposing mandatory coverage of childbirth expenses in employer-provided insurance policies.[81] Imposition of the mandatory health-insurance term—which represented a substantial departure from the usual contractual arrangements prior to the mandate—caused the wages of affected workers (most prominently, married women of childbearing age) to fall by at least the cost of the mandated coverage according to most of the author's estimates.[82] The study also found that the hours of employment of these workers were either unchanged or slightly higher with the mandate and that their probability of being employed was either unchanged or slightly lower.[83] In sum, "[t]he findings consistently suggest shifting of the costs of the mandates on the order of 100 percent, with little effect on net labor input."[84] These findings are not easy to reconcile with the conventional account, which predicts a fall in wages less than the cost of the benefit. (If the wage were going to adjust by the full cost of the benefit, then some substantial fraction

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[80] See, e.g., Paul A. Samuelson & William D. Nordhaus, Economics 681 (13th ed. 1989) (Table 28-2).

[81] Jonathan Gruber, The Incidence of Mandated Maternity Benefits, 84 Am. Econ. Rev. 622 (1994).

[82] Id. at 623, 630-31, 633, 636. Gruber performs a number of different regressions; one set did not yield statistically significant results, see id. at 638, while the others yielded statistically significant results along the lines described in the text. The confidence intervals for the majority of these results also include values indicating less than full shifting of the cost—but also, of course, values indicating much more than full shifting of the cost.

[83] Id. at 623, 633, 637.

[84] Id. at 623.

of employers should have offered the benefit even prior to the mandate.)

2. Behavioral Analysis

Departures from the assumptions of expected utility maximization by unboundedly rational agents suggest a different account of the effects of imposing mandatory contract terms, one that is consistent with the empirical findings just described. As noted above, the endowment effect implies that people are often less willing to sell entitlements that are given to them than to buy entitlements that they do not already possess; if given a mug, they will not sell it for $3, but if not given a mug, they will not buy one for that price. Thus, the fact that an employee (say) chooses not to purchase a particular workplace benefit if he is not granted an entitlement to it does not imply that he would want to sell the entitlement (if he could) once it has been granted. The corollary of this observation is that imposing a mandatory term may have different effects than the standard analysis predicts. In supply-and-demand terms, imagine a labor supply curve prior to the imposition of the mandate, reflecting willingness to work at different wage levels given provision of the benefit; the consequence of the endowment effect may be that this curve is shifted to the right once the mandate is imposed, and this move may more than compensate for the backward shift in the employer's labor demand curve as a result of the mandate. If this occurs, then the wages of the affected worker will fall by as much or more than the cost of the benefit. This is precisely what the study of mandated childbirth coverage finds.[85]

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[85] Richard Craswell, Passing On the Costs of Legal Rules: Efficiency and Distribution in Buyer-Seller Relationships, 43 Stan. L. Rev. 361, 389 (1991), offers an analogous analysis in the context of mandatory product warranties for consumers. As he notes, given the endowment effect, the mandatory term may cause the price paid by consumers to adjust by more than than the cost of the term, and the quantity of the good demanded may rise. The endowment effect has been extensively discussed in the legal literature in connection with waivable contract terms and the Coase Theorem. See, e.g., David Charny, Hypothetical Bargains: The Normative Structure of Contract Interpretation, 89 Michigan L. Rev. 1815, 1867-68 (1991) (waivable terms); Kelman, supra note 1 (Coase theorem).

Three caveats are important here. First, we do not say that the endowment effect is only consistent with complete or more than complete adjustment of the wage or price. Perhaps workers are not any more willing to supply labor in exchange for a given wage plus the benefit in question once they have an entitlement to the benefit; it may be just that they would be even *less* willing to supply labor in the absence of the benefit. It is also possible that conventional economic analysis, by incorporating a market failure such as adverse selection (a possibility not discussed by the above-mentioned critics of mandatory contract terms), can explain the empirical findings discussed above.[86] Our point is just the modest one that the behavioral account can predict an instance of observed behavior that is inconsistent with the standard law and economics account of mandatory terms. Future empirical work could attempt to address the adverse selection possibility by examining the effects of mandatory contract terms in a setting in which (in contrast to the insurance context) adverse selection is unlikely to be a significant force.

The second qualification is that the endowment effect may not operate in contexts in which the beneficiaries of a mandatory term must give up a preexisting level of income, since they may be highly averse to such a loss.[87] This qualification applies only to situations in which there is a financial loss relative to some preexisting expectation; thus it would not apply to, for example, a consumer's purchase of a durable good at a higher price due to the inclusion of a warranty. The final qualification here is that our analysis in this section is purely positive, concerned with the effects of imposing a mandatory contract term. The endowment effect does not necessarily imply that, from a normative perspective, mandatory terms are desirable; they may be efficient, in the sense that they would not be undone (if they could be) once imposed, but the situation without such terms is also efficient, for the same reasons given by the standard account, and there is no obvious means by which the two situations can be compared. Unlike several of the scenarios discussed in Part V below, in which we think there is often a relatively strong argument for choosing one normative

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[86] See Gruber, supra note 81, at 626 n. 9.

[87] See Kahneman & Tversky, supra note 10, at 277-79.

benchmark over another (say because people are likely to underestimate certain objective probabilities based on some form of judgment error), here there does not seem to be a clear basis for such a decision.

Our emphasis, then, is the positive question of the effects of imposing mandatory contract terms. The primary point is that there is a substantial research agenda to test various hypotheses; what we wish to suggest is that the conventional view cannot be accepted a priori and that there is reason to think that behavioral law and economics points in helpful directions.

III. The Content of Law

One of the goals of law and economics is to explain the content of law—what the law allows and what it prohibits. The traditional approach provides two tools for this analysis. First, laws may be efficient solutions to the problems of organizing society. Such laws can be thought of solutions to optimal contracting problems with all of the affected parties at the table.[88] Second, laws may come about because of the rent-seeking activities of politically powerful actors; many laws that benefit farmers, the elderly, labor unions, and concentrated industries have been explained along these lines.[89] The positive theory of law reflected in the conventional account thus predicts that the legal rules we observe will be rules that either maximize social wealth (if they are judge-made rules) or redistribute wealth to interest groups able to influence the legislative process. Law and economics scholars who reject this account of the content of law have not offered any alternative account to explain and predict the rules we observe.

The notion that laws emerge from considerations of efficiency and conventional rent seeking would probably strike most citizens as odd. Instead, we suspect that most members of society—which is to say most of the people who are entitled to elect legislators—hold the view, undoubtedly naively, that the purpose of the law is to codify "right" and "wrong." Certainly many criminal statutes would be

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[88] See William M. Landes & Richard A. Posner, The Independent Judiciary in an Interest-Group Perspective, 18 J. Law & Econ. 875 (1975).

[89] See George J. Stigler, The Theory of Economic Regulation, 2 Bell. J. Econ. & Mgmt. Sci. 3 (1971).

explained without reference to either of the above factors. In this section we argue that law and economics explanations of the content of law need to be modified by incorporating the ideas of bounded self-interest (in the form of fairness norms) and bounded rationality developed above. As we will try to show, many laws on the books appear to be difficult to justify on efficiency grounds (for example, those that prohibit mutually beneficial exchanges without obvious externalities) and seem to benefit groups that do not have much lobbying power (such as the poor or middle class). We argue that the explanation for the "anomalous" laws is typically a quite simple one: most people think the result is fair. We also suggest that some laws we observe reflect neither efficiency nor conventional rent seeking but, instead, aspects of bounded rationality. Our point is not the general (and rather obvious) one that fairness concerns and bounded rationality may shape the content of law; we seek to show specifically how behavioral analysis can provide real predictive and explanatory power for particular laws we observe. We also do not claim that fairness concerns and bounded rationality explain every aspect of the content of law—just that they provide a useful supplement to existing explanations.[90]

The mechanisms underlying our behavioral economic account of the content of law are simple and conventional. With the existing analysis, we assume (for present purposes, and insofar as statutory rather than judge-made law is concerned) that legislators are maximizers interested in their own reelection. Legislators interested in their own reelection will be responsive to the preferences and judgments of their constituents and those of powerful interest groups. If constituents believe that a certain practice is unfair or dangerous, and should be banned or regulated, self-interested legislators will respond, even if they do not share these views. Likewise, if a mobilized group holds such views, legislators' response will be affected, in much the same way as if the group sought

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[90] Our analysis in this Part is similar in spirit to that offered by earlier work such as David Cohen & Jack Knetsch, Judicial Choice and Disparities Between Measures of Economic Values, 30 Osgoode Hall L.J. 737 (1992) (seeking to explain various legal doctrines based on the endowment effect), and Sara Sun Beale, What's Law Got To Do With It? 1 Buffalo Crim. L. Rev. 23 (1997) (seeking to explain criminal law based on the availability heuristic and other aspects of bounded rationality).

legislation to serve a narrowly defined financial self-interest, as posited by the standard account.

Mobilized groups may also attempt to manage and exploit the public's views, including views influenced by bounded self-interest and bounded rationality, to bolster their own efforts; a prime example discussed below is the "availability entrepreneur," who seeks to publicize an event in order to make it more "available" to the general public, and thus to increase the public's demand for regulation. We suspect that a full account of the content of law would have to incorporate legislators' independent judgments about fairness or risk, which play an occasional role; but we do not discuss that point here because for the examples we consider, public and interest-group perceptions seem to provide a good (and the most parsimonious) account of the laws we observe.

A. Bans on Market Transactions

This section discusses the demand for the law insofar as that demand is affected by people's bounded self-interest and in particular by their taste for fairness as they understand it. We do not mean to defend the laws that we describe; we suggest more modestly that people's commitment to fairness is part of the causal mechanism that establishes those laws. Fairness norms interact with other forces to produce some of the seemingly anomalous laws we observe. "Fairness entrepreneurs" may play a role, mobilizing public judgments to serve their (selfish or non-selfish) interests.

1. Bans on Economic Transactions

(a) A puzzle

A pervasive feature of law is that mutually desired trades are blocked. Perhaps most puzzling amidst this landscape—which includes bans on baby-selling and vote-trading, discussed below—are bans on conventional "economic" transactions, such as usurious lending, price gouging, and ticket scalping. Usury, or charging an interest rate above a certain level, is prohibited by most states in consumer lending transactions; price gouging, or the charging of "grossly excessive" or "unconscionable" prices, is prohibited during "states of emergency" (as after a flood or other natural disaster) in many states that have recent experience with such events; and ticket scalping, or the resale of tickets at prices well above face prices (in

excess of a modest margin to cover ticket brokers' costs), is prohibited by roughly half of all states, including New York (with its heavy theater population) and its neighboring states.[91] What accounts for these laws, which impose constraints on gain-producing transactions for ordinary commodities such as television sets and theater tickets?

Not surprisingly, economists and economically oriented lawyers often view these laws as inefficient and anomalous.[92] The laws also do not generally seem well explained in terms of conventional rent-seeking by a politically powerful faction. One might argue that ticket-scalping laws are an exception to this last point, on the ground that ticket sellers (who may be politically powerful) might

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[91] On usury, see, for example, Uniform Consumer Credit Code §2.201. On price gouging, see Code of Ala. §8-31-3; 1997 Ark. Acts 376; Cal. Pen. Code §396; Conn. St. §42-232; Fla. St. §501.160; Ga. St. §10-1-393.4; La. R. S. 29:732; N.Y. Gen. Bus. §396-r; Tex. Bus. & Com. Code §17.46(a) & 6(25). On ticket scalping, see Ark. Code Ann. § 5-63-201; Conn. Gen. Stat. Ann. § 53-289; Del. Code Ann. tit. 11, § 918; Del. Code Ann. tit. 29 § 4809; Fla. Stat. Ann. § 817.36; Ga. Code Ann. § 10-1-310; Ind. Code Ann. § 25-9-1-26; Ind. Code Ann. § 4-30-13-1; Ky. Rev. Stat. Ann § 518.070; La. Rev. Stat. Ann. § 4-1-1; La. Rev. Stat. Ann. § 4-3-73; Md. Code Ann., [Bus. Reg.] § 4-318; Md. Code Ann., [Bus. Reg.] § 9-124; Mass. Gen. L. ch. 140, § 185A; Mass. Gen. L. ch. 140, § 185D; Mass. Gen. L. ch. 140, § 185E; Mass. Gen. L. ch. 140, § 185F; Mass. Gen. L. ch. 140, § 185G; Mich. Comp. Laws Ann. § 750.465; Minn. Stat. Ann. § 609.805; Miss. Code Ann. § 97-23-97; Mo. Ann. Stat. § 578.395; N. J. Stat. Ann. § 56:8-27; N. J. Stat. Ann. § 56:8-28; N. J. Stat. Ann. § 56:8-30; N. J. Stat. Ann. § 56:8-33; N. J. Stat. Ann. § 56:8-34; N. J. Stat. Ann. § 56:8-35; N. J. Stat. Ann. § 56:8-37; N. J. Stat. Ann. § 56:8-38; N. M. Stat. Ann. § 30-46-1; N. Y. [Arts & Cult. Aff.] Law § 25.01; N. Y. [Arts & Cult. Aff.] Law § 25.03; N. Y. [Arts & Cult. Aff.] Law § 25.05; N. Y. [Arts & Cult. Aff.] Law § 25.07; N. Y. [Arts & Cult. Aff.] Law § 25.08; N. Y. [Arts & Cult. Aff.] Law § 25.09; N. Y. [Arts & Cult. Aff.] Law § 25.11; N. Y. [Arts & Cult. Aff.] Law § 25.13; N. Y. [Arts & Cult. Aff.] Law § 25.17; N. Y. [Arts & Cult. Aff.] Law § 25.29; N. Y. [Arts & Cult. Aff.] Law § 25.35; N. C. Gen. Stat. § 14-344; 4 Pa. Cons. Stat. Ann. § 201; 4 Pa. Cons. Stat. Ann § 202; 4 Pa. Cons. Stat. Ann § 203; 4 Pa. Cons. Stat. Ann § 205; 4 Pa. Cons. Stat. Ann § 210; 4 Pa. Cons. Stat. Ann § 211; 4 Pa. Cons. Stat. Ann § 212; 4 Pa. Cons. Stat. Ann § 213; R. I. Gen. Laws § 5-22-26; and S. C. Code Ann. § 16-17-710.

[92] See, e.g., John Tierney, Tickets? Supply Meets Demand on Sidewalk, New York Times, Dec. 26, 1992, § 1, at 1 (quoting Princeton economist William Baumol criticizing laws against ticket scalping).

lobby in favor of the laws because moderate prices are necessary to create demand, which in turn certifies quality.[93] (Thus, for example, the argument would be that restaurant owners do not raise prices when waits develop for tables, and if a secondary market in restaurant reservations were to develop with very high prices for tables, restaurateurs might wish to outlaw it.) The difficulty with this form of argument as applied here is that it cannot explain the application of ticket-scalping laws to perennially popular events whose quality is known from TV—a category that includes most professional sporting events. Our point here is actually a more general one: although it may be possible to offer efficiency or conventional rent-seeking explanations for certain sorts of laws banning economic transactions, there does not seem to be a general theory or set of theories that can explain all or even most of these laws on traditional grounds.[94]

(b) A behavioral account

By contrast, laws banning usurious lending, price gouging, and ticket scalping when such activities are prevalent are a straightforward prediction of the theory of perceived fairness developed in Part II above. (We assume here that self-interested legislators are responsive to citizens' or other actors' demand for the content of law.) In the case of each of these bans, the transaction in question is a significant departure from the usual terms of trade in the market for the good in question—that is, a significant departure from the "reference transaction." Behavioral analysis predicts that if trades are occurring frequently in a given jurisdiction at terms far from those of the reference transaction, there will be strong pressure for a law banning such trades. Note that the prediction is *not* that all high prices (ones that make it difficult or impossible for some people to afford things they might want) will be banned; what we predict

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[93] See Gary S. Becker, A Note on Restaurant Pricing and Other Examples of Social Influences on Price, 99 J. Pol. Econ. 1109 (1991).

[94] For an argument that usury laws can be explained on conventional economic grounds, see Eric Posner, Contract Law in the Welfare State, 24 J. Legal Stud. 283 (1995). Peter Diamond has pointed out to us that ticket-scalping laws may be desirable to sports team owners who wish to engage in certain types of dynamic pricing strategies over the course of the season.

will be banned are transactions at terms far from the terms on which those transactions *generally occur in the marketplace*.

Consider this example:

> A store has been sold out of the popular Cabbage Patch dolls for a month. A week before Christmas a single doll is discovered in a store room. The managers know that many customers would like to buy the doll. They announce over the store's public address system that the doll will be sold by auction to the customer who offers to pay the most.[95]

Nearly three-quarters of the respondents judged this action to be either somewhat unfair or very unfair, though, of course, an economic analysis would judge the auction the most efficient method of assuring that the doll goes to the person who values it most.[96] Although the auction is efficient, it represents a departure from the "reference transaction," under which the doll is sold at its usual price. (Of course, there would be no need for a law banning such behavior, since it does not appear to be prevalent.) As in the doll example, if money is loaned to individuals at a rate of interest significantly greater than the rate at which similarly-sized loans are made to other customers, then the lender's behavior may be viewed as unfair. Since lumber generally tends to sell for a particular price, sales at far higher prices in the wake of (say) a hurricane, which drives demand sky high, are thought unfair. Tickets to sporting events or the theater often sell for around the face price of the ticket, so large mark-ups over that amount are judged unfair. Consistent with this last suggestion, subjects asked whether a team should allocate its few remaining tickets to a key football game through an auction thought that this approach would be unfair; allocation based on who waited in line longest was the preferred solution.[97] Of course, waiting in line for tickets is precisely what happens with laws against ticket scalping. Thus, pervasive fairness norms appear to shape attitudes (and hence possibly law) on usury, price gouging, and ticket scalping.

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[95] Kahneman, Knetsch, & Thaler, supra note 16, at 735.
[96] Id.
[97] Kahneman, Knetsch, & Thaler, supra note 16, at S287-88.

"Conventional economic analyses assume as a matter of course that excess demand for a good creates an opportunity for suppliers to raise prices" and that "[t]he profit-seeking adjustments that clear the market are . . . as natural as water finding its level—and as ethically neutral," but "the lay public does not share this indifference."[98] A system in which, for example, only fans able to pay $3000 could attend the Super Bowl would be a system characterized by the sort of severe departure from the reference transaction that people view as intolerable. As a letter-writer to the *New York Times* colorfully put it in responding to coverage of ticket-scalping laws: "With legalized scalping, lower- and middle-income consumers would be relegated to watching events at home or buying overpriced seats in the nosebleed section"; such a system of "entertainment Darwinism" would be a "raw deal" for the average consumer.[99]

We emphasize that we need not (and do not) find these views of fairness necessarily rational or compelling. Many of those who think "usurious" lenders are "unfair" might not have thought through the implications of their views (for example, that paying an outrageous price for a loan may be better than paying an infinite price, or that a loan to a riskier borrower is a product different in kind from a loan to a safer borrower). Still, if such views are widespread, they may underlie certain patterns in the content of law, such as the legal restrictions on usury, price gouging and ticket scalping. Our claim here is a positive one about the content of the law we observe, not a prescriptive or normative one about the shape practices or rules should take. As a positive matter, behavioral analysis predicts that if trades are commonly occurring with terms far from those of the reference transaction, then legal rules will often ban trades on such terms.

We do not claim to have offered a definitive explanation for the pattern of usury, price gouging, and ticket scalping laws we observe. Usury seems to be generally prohibited across states, so one is not faced with the question of why we observe bans in some states but not others. The same cannot be said of price gouging and ticket scalping; each is prohibited only in certain states. Price gouging appears to be prohibited primarily by states who have recently

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[98] Kahneman, Knetsch, & Thaler, supra note 16, at 735.
[99] Letter to the Editor, New York Times, May 9, 1995, §A, at 26.

experienced (or whose neighbors have recently experienced) natural disasters; and ticket scalping laws may be concentrated in states with very popular theater or sporting events. More in-depth empirical research would be required to determine if these patterns bear out, and whether conventional interest-group theories provide an alternative account. Our goal here is simply to suggest the likelihood, from the perspective of behavioral law and economics, that observed laws reflect, in systematic and predictable ways, fairness considerations as well as efficiency and conventional forms of rent seeking.

(c) Private behavior

It is interesting to note that these transaction-banning laws often mimic, rather than constrain, the behavior of the firms they regulate. Consider first usury: It is a well-known puzzle of lending markets that lenders often refuse to loan money to risky borrowers at above-market interest rates; rather, someone either qualifies for a loan at the offered rate or does not qualify for a loan at all.[100] This is true even when a modest increase in the interest rate would not violate usury laws.[101] (Adverse selection considerations may also explain this behavior,[102] but they cannot easily explain the existence of *laws* against such behavior.) Price gouging and ticket scalping are similar in terms of private actors' behavior. Thus, when Hurricane Andrew hit Florida and the demand for lumber and other building supplies skyrocketed, Home Depot, a major national chain, continued to sell these goods at its usual prices, despite the fact that the stock could have been sold at an enormous (short-term) profit, and despite the fact that no then-existing law banned price

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[100] See, e.g., Keith N. Hylton & Vincent D. Rougeau, Lending Discrimination: Economic Theory, Econometric Evidence, and the Community Reinvestment Act, 85 Geo. L.J. 237, 258 (1996) (residential mortgage lending market); Board of Governors of the Federal Reserve System, Report to the Congress on Community Development Lending by Depository Institutions, Oct. 1993, at 34 (same).

[101] Hylton, supra note 100, at 258 & n. 85.

[102] Michael Klausner, Market Failure and Community Investment: A Market-Oriented Alternative to the Community Reinvestment Act, 143 U. Pa. L. Rev. 1561, 1566-68 (1995) (citing Joseph P. Stiglitz & Andrew Weiss, Credit Rationing in Markets with Imperfect Information, 71 Am. Econ. Rev. 393 (1981)).

increases.[103] More generally, economists have often remarked on the failure of firms to increase prices in response to temporary increases in demand.[104] Likewise, an interesting feature of ticket-scalping laws is that they will keep prices down only to the extent that firms choose to sell tickets at reasonable prices in the first place; but in fact firms routinely do this. For example, during the 1997 NBA playoffs, the Chicago Bulls sold some tickets to the general public at prices that were somewhat higher than regular season games but a fraction of the price the tickets commanded on the (legal in Illinois) ticket broker open market. As the head of a major theater company explained, "there's a strong public relations argument" against raising prices for tickets for very popular shows [and presumably sporting events as well]—despite excess demand for seats at the going prices—because the public already believes "that Broadway ticket prices are too high."[105] "Even though we could sell tickets at $100," another theater owner said, "we'd be cutting our own throats because it would be a P.R. disaster for Broadway."[106] Why would it be a "P.R. disaster" if the market would allow them to sell their tickets at $100? We think this would be so because a $100 ticket price for a very popular show would have been viewed as unfair by many members of the public given that the usual price for a ticket was below this.

Consistent with the foregoing analysis, recent evidence of price stickiness shows that firms' behavior is affected greatly by their customers' perceptions of unfair price increases.[107] Note that this is not a standard reputation story; fairness considerations are the reason that raising prices harms the firm's reputation. None of this is to say that firms never raise prices in an opportunistic fashion; for instance,

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[103] Steve Lohr, Lessons from a Hurricane: It Pays Not to Gouge, New York Times, Sept. 22, 1992, §D, at 1.

[104] David D. Haddock & Fred S. McChesney, Why Do Firms Contrive Shortages? The Economics of Intentional Mispricing, 32 Econ. Inquiry 562, 562-63 (1994).

[105] Peter Passell, If Scalpers Can Get So Much, Why Aren't Tickets Costlier? New York Times, Dec. 23, 1993, §D, at 2 (quoting Gerald Schoenfeld, head of The Shubert Organization).

[106] Tierney, supra note 53, at 1 (quoting Rocco Landesman, president of Jujamcyn Theaters).

[107] Alan Blinder et al., Asking About Prices 111, 150, 164 (1998).

when sports teams sell playoff tickets to season ticket holders at below-market prices, it may be that the ticket holders paid a premium for the playoff tickets ex ante (through the purchase of season tickets). In each of the contexts we examine, our point is just the modest one that fairness norms often seem to constrain firms' behavior in much the same way that they shape laws against behavior violating those norms.

Why then are the laws necessary? Some of the relevant actors will not be constrained by fairness norms in the absence of a law. Noninstitutional lenders may be willing to lend at exorbitant rates; suppliers selling lumber out of the back of pick-up trucks will often charge whatever the market will bear (as occurred after Hurricane Andrew, prompting the enactment of a price-gouging law);[108] ticket scalpers, who are typically anonymous actors engaged in one-time transactions, have no reason to keep prices down. It is these actors who are regulated by the law. The more powerful mainstream firms will tend to support, or at least not oppose, rules banning unfair transactions. (Note, though, that their support would not be predicted by the standard account.)

2. Other Bans

Laws banning economic transactions are just a species of a broader form of regulation of transactions. Many deals are blocked, across a wide range of contexts. People may not buy and sell body parts. They cannot trade rights of free speech or sell their votes. In some states, commercial surrogacy is prohibited, and both prostitution and baby-selling are banned in all states. People may not contract around bans on race and sex discrimination, as for example through written agreements. Blocked trades can be found in every American jurisdiction.

Bans of this variety raise serious normative questions; those questions have been well-ventilated. Doubtless reasonable distinctions can be drawn between bans in different areas; sometimes externalities are readily apparent. We make a simple positive point here. Behavioral analysis suggests that pervasive judgments about fairness may account for many such bans on voluntary deals. Whether or not those judgments make sense, they

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[108] Lohr, supra note 103, at 1.

seem to be widespread, and they help to explain the persistence of legislation that is often difficult to explain by reference to an efficiency or rent-seeking account. In banning certain deals, legislators may be responding to community sentiments about what kinds of things are properly subject to market arrangements. The reference transaction in these areas is generally "no transaction"; just as the norm or benchmark is the usual or face price of the ticket, or an equal division of the amount to be divided in the ultimatum game, the norm or benchmark here is "no market exchange." Departures from that norm are viewed as unfair and are prohibited.

How could this behavioral theory of law be tested? One idea is to determine, based on historical evidence, what sorts of transactions were generally not engaged in (despite their being technologically feasible—for example, baby selling) regardless of the existence of a law banning them. These transactions could be said to have a no-transaction benchmark. (The importance of looking to a pre-law benchmark is that the existence of a legal ban could itself produce a no-market-exchange reference point, in which case the reference point obviously could not account for the existence of the ban.) Behavioral analysis predicts that such transactions will be legally censured. The existing law and economics analysis, by contrast, predicts that such transactions will be banned only if a ban is either efficient or favorable to a politically powerful interest group.

B. Prior Restraints on Speech

Another instance in which fairness-related norms, and in addition bounded rationality, may affect law involves one of the enduring puzzles in first amendment law: the special judicial hostility to "prior restraints" on speech, most notably injunctions.[109] A court may well refuse to issue an injunction against speech even if it would allow subsequent punishment of that same speech. The puzzle is that a prior restraint involves subsequent punishment too; what an injunction means is that a violator will be subject to (subsequent) sanctions. Why is a criminal statute any less problematic than an injunction whose violation produces criminal penalties?

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[109] See, e.g., Stone et al., Constitutional Law 1141-1144 (3d ed. 1995).

Conventional economic analysis provides no satisfying answer to this question. True, the injunction might be thought to create the prospect of a greater total punishment for the speech, but no one has suggested that the First Amendment imposes limits on the severity of punishment for speech that the government is entitled to criminalize. In any case, many criminal statutes impose greater punishments than many injunctions, and the latter are nonetheless more troublesome than the former.

Can behavioral analysis explain the law's special treatment of prior restraints? As noted in Part I.B above, court-ordered remedies are likely to create special forms of attachment for their beneficiaries; individuals will typically be reluctant to forego rights granted by such remedies, due to the perceived unfairness of that outcome and the type of attachment created by the endowment effect. This is apt to be as true for prosecutors as for everyone else. A prosecutor who has sought an injunction may be particularly insistent on ensuring that punishment occurs. A criminal statute, standing by itself and unaccompanied by an injunction, is likely to produce a different response on the part of the prosecutor. Reasonable defendants know the difference. Hence it is especially important for a court to ensure that any injunction imposed on speech is not issued *in advance of an accurate judgment that the speech involved is unprotected by the first amendment.*

As it happens, this account matches the most sophisticated defenses of the special barrier to prior restraints.[110] Those defenses urge that the real purpose of the prior restraint doctrine is to ensure that no regulation is imposed without a reliable judgment that the first amendment does not protect the speech at risk. The doctrine is difficult to explain on conventional economic principles but is a natural inference from behavioral ones.

C. Anecdote-Driven Environmental Legislation (With Particular Reference to Superfund)

1. Estimating the Likelihood of Uncertain Events

Thus far the discussion has focused on the role of bounded self-interest (specifically, fairness-related norms) and the endowment

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[110] See Martin Redish, The Proper Role of the Prior Restraint Doctrine in First Amendment Theory, 70 Va. L. Rev. 53, 55, 58 (1984).

effect in predicting and explaining the content of law. But judgment errors by boundedly rational individuals also play a significant role here. In particular, people seek law in areas such as environmental legislation on the basis of their judgments about the probabilities associated with certain harmful activities. Their judgments about probabilities will often be affected by how "available" other instances of the harm in question are, that is, on how easily such instances come to mind. In this section we offer an account of the Superfund statute, perhaps the most well-known and popular environmental statute, on this ground.

Here is a familiar example of availability: individuals asked how many seven-letter words in a 2,000-word section of a novel end in "ing" give much larger estimates than individuals asked how many words in such a section have "n" as the second-to-last letter, despite the fact that objectively there are more words which satisfy the latter criterion than the former.[111] Reliance on how "available" instances of the event in question are is a form of judgment error, but the error is fully rational—in the sense of reflecting optimizing behavior—for people with limited information. Still, it can lead to systematic errors in probability assessment. In the context of environmental legislation, it encourages the well-known "pollutant of the month" syndrome, where regulation is driven by recent and memorable instances of harm. When beliefs and preferences are produced by a set of probability judgments, made inaccurate by the availability heuristic, legislation will predictably become anecdote-driven. Many illustrations come to mind: the elimination of the pesticide Alar from the market after a public outcry generated by the television show "60 Minutes"; the outcry over Agent Orange and Times Beach; the banning of both saccharin and asbestos in schools after a large amount of media attention. The same phenomenon may occur in other areas of regulatory law; an example here is the move toward heavy regulation of school bus safety in the wake of

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[111] Amos Tversky & Daniel Kahneman, Extensional Versus Intuitive Reasoning: The Conjunction Fallacy in Probability Judgment, 90 Psychol. Rev. 293 (1983).

media coverage of school bus accidents in which children were killed.[112]

What determines how available a particular environmental hazard is? Two factors are particularly important: the observed frequency of the hazard and its salience. Thus, if a particular hazard has materialized recently, people are likely to attach a higher probability to its occurring in the future. And this is particularly true if the hazard has a high degree of salience—as, for instance, with the discovery of asbestos in schools, where many children are present. Apart from the nature of the event, salience is heavily influenced by the way the event is packaged by the media, organized interest groups, and politicians.

Interested actors in the private and public sectors can be expected to exploit the availability heuristic for their own purposes. These actors are amateur behavioralists, operating strategically to promote their selfish or nonselfish goals. "Availability entrepreneurs" will thus focus attention on a specific event in order to ensure that this event will be salient and available to many members of the public.[113] Well-organized groups in the private sector very frequently use this strategy, thus showing that they are fine behavioralists. Self-interested politicians may use similar strategies to enhance their reelection prospects. Although self-serving behavior by such actors is of course an element of the conventional economic account, the role of such factors as availability is not; this is what is added by behavioral analysis.

The availability heuristic can lead to under- as well as over-regulation. People sometimes (although not always) underestimate the likelihood of low-probability or low salience events because these threats simply do not make it onto people's "radar screens";[114] many

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[112] See Jerry L. Mashaw & David Harfst, The Struggle for Auto Safety 141-46 (1990).

[113] See Timur Kuran & Cass R. Sunstein, Availability Cascades and Risk Regulation (unpublished manuscript 1998).

[114] See Howard Kunreuther, The Economics of Protection Against Low Probability Events, in Decision Making: An Interdisciplinary Inquiry 195, 209 (Gerardo R. Ungson & Daniel N. Braunstein eds., 1982); Howard Kunreuther, Limited Knowledge and Insurance Protection, 24 Public Policy 227, 235-36, 243-44 (1976). For discussion of *over*estimation of the likelihood of low-frequency events, see Colin F. Camerer & Howard Kunreuther,

health and environmental risks (such as the health threats from poor diet and exercise) may fit this description with some parts of the population. But when a particular threat, even an unlikely one, becomes available, as when, for example, asbestos is discovered in schools, then regulation will be demanded. The behavioral account thus predicts a patchwork of environmental laws characterized by both over- and under-regulation, with over-regulation when a particular risk has recently materialized, particularly if the harm in question is highly salient.

2. Superfund

The basic point that availability may affect the demand for environmental legislation is not new.[115] We wish to add two features to the analysis: first, an understanding of the mechanisms through which the availability heuristic may operate to produce environmental legislation (and here we emphasize the notion of "availability entrepreneurs"); and second, the fact that the behavioral account predicts the enactment of Superfund, a major piece of environmental legislation that is not readily explained on conventional grounds.

Conventional approaches point to the important role of interest groups in shaping environmental law; these groups can use the law to redistribute resources in their preferred directions. Some of these groups are sincerely concerned with environmental protection; others have economic interests for which environmental issues operate as a smokescreen. Explanations of this kind have had some success, but they fail to account for Superfund.

Of course it is possible (as it always is) to generate post hoc accounts that show that some groups benefited from legislation, and to suggest that such legislation was passed *because* some groups benefited from it. Superfund is no exception. But an examination of the history of the statute shows that this explanation is extremely

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Decision Processes for Low Probability Events: Policy Implications, 8 J. Pol. Anal. & Management 565, 566 (1989).

[115] See Roger G. Noll & James Krier, Some Implications of Cognitive Psychology for Risk Regulation, 19 J. Legal Stud. 747, 762 (1990) (suggesting that availability may affect the pattern of environmental regulation we observe); Cass R. Sunstein, Congress, Constitutional Moments, and the Cost-Benefit State, 48 Stan. L. Rev. 247, 265-66 (1996) (same).

weak. Interest groups played little part in initiating its enactment. Instead the key actor, as described more fully below, was the Environmental Protection Agency, and the key mechanism was the availability heuristic.

Superfund was passed with substantial legislative and public support; in light of its crudely drafted character and uncertain empirical support, what is remarkable is how little opposition the statute provoked. What is even more remarkable is that for the last seventeen years, Americans have consistently ranked "abandoned toxic waste dumps" among the three most important environmental problems, even though experts believe that this is one of the least pressing environmental problems, if indeed it qualifies as a serious problem at all. Experts contend that in terms of risks to human health, there are at least a dozen problems that are more serious; many of them receive less in the way of public (and legislative) support.

Availability provides a convincing explanation of Superfund's existence and its endurance. Its initial development occurred when officials within EPA, concerned about an apparent gap in federal law and eager to consolidate their authority over issues of public health, began to draft new legislation in order to respond to the existence of abandoned hazardous waste sites. But it is doubtful that EPA could have succeeded if not for the fact that in August of 1978, national news began to focus on what was soon seen as a "ticking time bomb" at Love Canal, New York, consisting of apparent leaks from the disposal of 21,000 tons of chemical waste into the Canal between 1943 and 1952. In the middle and late 1970s, studies of groundwater and cancer incidence appeared to show that the leaks had created serious health risks, to the point where the New York Health Commissioner declared a public emergency on August 2, 1978. Within two weeks, President Carter declared an emergency in the area. A kind of cascade effect occurred, and hence in the period between August and October, 1978, the national news was saturated with stories of the risks to citizens near Love Canal.

The publicity continued in 1979 and 1980, the crucial years for Superfund's enactment. There can be no doubt that the Love Canal publicity was pivotal to the law's passage in 1980. In that year, Time magazine made the topic a cover story, and network documentaries

followed suit. Polls showed that eighty percent of Americans favored prompt federal action to identify and clean up potentially hazardous abandoned waste sites. Congress responded quickly with the new statute. And to this date, American presidents and serious presidential candidates of both major parties invoke abandoned hazardous waste dumps as a leading environmental problem. By the way, it remains unproven that Love Canal created significant health risks at any stage.

The behavioral account of Superfund is that the availability of "Love Canal" as a symbol for the problem of abandoned hazardous waste dumps greatly intensified public concern, to the point where a legislative response became nearly inevitable, no matter what the actual facts might be.[116] And there can be no doubt that proponents of Superfund self-consciously exploited the Love Canal incident. During crucial periods in the legislative debate, the prime proponent of the new legislation—the EPA—warned, very publicly, that hundreds of "Love Canals" could be found throughout the country. The EPA thus became an "availability entrepreneur," focusing attention on a specific event in order to ensure that this event would be highly available to many members of the public.

We do not say that conventional interest-group considerations played no role in the specific shape the Superfund statute took. The ultimate design of the statute surely owed a great deal to what relevant interest groups were willing to tolerate; though powerful private groups did not seek the legislation, they did influence its content and structure. But the enactment and continued popularity of Superfund is not predicted by the conventional account alone. The behavioral account, in contrast, suggests that the occurrence of an event such as Love Canal, particularly when played up and dramatized by the media and other actors, will produce a legislative response. Superfund is one example; regulatory responses to Alar, Agent Orange, saccharin, and asbestos are others. Available instances of risk or threat seem to shape the content of law.

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[116] Cf. W. Kip Viscusi, Alarmist Decisions with Divergent Risk Information, 107 Econ. J. 1657 (1997) (in the presence of divergent information about risks, people place inordinate weight on high risk assessments).

IV. Prescriptions

In this Part we shift our focus from the positive to the prescriptive. Instead of seeking to explain what the effects of law will be and why we have the laws we do, we now explore how the law can best be structured to achieve specified ends—deterring socially undesirable behavior through the tort system, encouraging measures that enhance human health, and so on. Our claim in each context we examine is that attention to behavioral insights can improve the law's ability to move society toward desired outcomes. Our primary emphasis is on problems in processing information, problems that create difficulties both for juries during trials and for those responding to information required by government or coming from government itself. Thus bounded rationality, in the form of both judgment errors and behavior in accordance with prospect theory rather than expected utility theory, are the central emphases in this Part. Section A deals with juries, while section B deals with government information campaigns and mandatory disclosure. Section C emphasizes our second bound on human behavior, bounded willpower, and discusses its relevance to prescriptions directed toward deterring crime.

This Part discusses only a handful of the many areas in which sound prescriptive analysis may require us to consider possible bounds on jurors' or other actors' decision making. Other authors have applied these insights to other topics in the economic analysis of law. Thus, for example, Daniel Kahneman and David Schkade, along with one of the present authors (Sunstein), have challenged the economic prescription for punitive damage awards recently offered by A. Mitchell Polinsky and Steven Shavell: that juries should be instructed to focus on the probability of nondetection of the tortfeasor's activities in order to achieve optimal deterrence through punitive awards.[117] From the behavioral point of view, this prescription fails to appreciate the cognitive and motivational limitations on jury decision making. Because of the hindsight bias and overoptimism problems described below, juries will have difficulty making probability estimates, and in addition they appear to come to the task of awarding punitive damages with strong

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[117] Polinsky & Shavell, supra note 66, at 887-91.

retributive instincts.[118] Thus the goal of optimal deterrence may well be best achieved through administrative agencies rather than juries.[119]

Another example of the application of behavioral economics to prescriptive analysis is Thomas Jackson's discussion of discharge policy in bankruptcy law. Although standard economic ideas of risk allocation would often support nondischargeability of debts, Jackson draws on aspects of what we have termed bounded rationality and bounded willpower to support the "fresh start" policy of discharge and to sketch the specific contours it should take.[120] Our goal in this Part is to point to some additional topics in the economic analysis of law in which a more accurate understanding of decision making can improve upon conventional law and economics prescriptions.

A. Negligence Determinations and Other Determinations of Fact

1. Background

Frequently juries are called upon to determine the probability of an event that ended up occurring; a prominent example is the negligence standard, which in its usual formulation requires jurors to assess the costs and benefits of the defendant's course of action from an ex ante perspective, and thus to determine the probability that harm would end up coming of that action. These determinations are made with the "benefit" of hindsight; jurors know at the time they make their decision that the event in question did in fact occur. Jurors' determinations are thus likely to be afflicted by "hindsight bias"—the pronounced tendency of decision makers to attach an excessively high probability to an event simply because it ended up occurring.[121] Hindsight bias has been observed in a large number of studies, including studies of "expert" actors such as physicians, who, when asked to assess the probabilities of alternative diagnoses, given

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[118] Cass R. Sunstein, Daniel Kahneman, & David Schkade, Assessing Punitive Damages, ___ Yale L.J. ___ (forthcoming 1998) [draft at 11-12, 35-36].

[119] Id.

[120] Thomas H. Jackson, The Fresh-Start Policy in Bankruptcy Law, 98 Harv. L. Rev. 1391, 1394-95, 1399-1401 (1985).

[121] Baruch Fischoff, Hindsight ≠ Foresight: The Effect of Outcome Knowlege on Judgment Under Uncertainty, 1 J. Experimental Psychol. Hum. Perception & Performance 288 (1975).

a set of symptoms, give significantly different estimates depending on what they are told the actual diagnosis turned out to be.[122] Hindsight bias has also been observed in at least two studies on negligence determinations specifically.[123] In the negligence studies, jurors—armed with knowledge that harm had in fact occurred—were found to attach significantly higher probabilities to harm than ex ante decision makers—those not informed of the occurrence of harm.[124] This is a straightforward prediction of the many prior studies on hindsight bias.[125] Although the negligence studies asked for individual rather than group probabilities (raising the question whether group interaction on an actual jury could dispel hindsight bias), other studies have found the bias in group as well as individual settings.[126]

Hindsight bias will lead juries making negligence determinations to find defendants liable more frequently than if cost-benefit analysis were done correctly—that is, on an ex ante basis. Plaintiffs will win cases they deserve to lose. This prediction is consistent with the frequently expressed (though difficult to verify) view that the tort system imposes too much liability.[127]

A threshold issue raised by the hindsight-bias account of negligence determinations is whether hindsight bias is simply a

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[122] Hal R. Arkes et al., Eliminating the Hindsight Bias, 73 J. of Applied Psychology 305 (1988).

[123] See Kim A. Kamin & Jeffrey Rachlinski, Ex Post ≠ Ex Ante, 19 Law & Hum. Behavior 89 (1995); Susan J. LaBine & Gary La Bine, Determinations of Negligence and the Hindsight Bias, 20 Law & Hum. Behavior 501 (1996).

[124] Kamin & Rachlinski, supra note 121, at 98; LaBine & LaBine, supra note 121, at 509-10.

[125] See, e.g. Arkes et al., supra note 122.

[126] Dagmar Stahlberg et al., We Knew It All Along: Hindsight Bias in Groups, 63 Org. Behav. & Human Decision Proc. 46 (1995); Ed Bukszar & Terry Connolly, Hindsight Bias and Strategic Choice: Some Problems in Learning from Experience, 31 Academy Mgmt. J. 628 (1988).

[127] See, e.g., George Eads & Peter Reuter, Designing Safer Products: Corporate Responses to Product Liability Law and Regulation 107 (1983) (Rand Institute for Civil Justice study); Peter Huber, Liability: The Legal Revolution and Its Consequences 11 (1988); Jeffrey O'Connell, Ending Insult to Injury: No-Fault Insurance for Products and Services 42-43 (1975); John G. Fleming, Drug Injury Compensation Plans, 30 Am. J. of Comparative L. 297, 311 (1982); Stephen D. Sugarman, Doing Away with Tort Law, 73 Calif. L. Rev. 555, 581-82 (1985).

countervailing weight to a tendency on the part of defendants to underestimate the likelihood of being sanctioned. A common feature of human behavior is overoptimism: people tend to think that bad events are far less likely to happen to them than to others. Thus, most people think their probability of a bad outcome is far less than others' probability, although of course this cannot be true for more than half the population.[128] If defendants exhibit such overoptimism, then they will be underdeterred by a correct application of the negligence standard; overestimation of the probability of harm based on hindsight bias will then be a desirable countervailing factor. We think that defendant overoptimism is likely to be a much smaller factor for firms than for individual defendants, since firms that make systematic errors in judgment will be at a competitive disadvantage. And for individuals, the role of overoptimism is likely to vary significantly with context. In a case in which the threat of being found liable is highly salient, individuals will be likely to overestimate the likelihood of being sanctioned. Hindsight bias, in contrast, seems to be an across-the-board phenomenon; it has been observed in a wide range of contexts across many studies and is likely to be present whenever a jury makes a negligence determination.

It is also possible that the occurrence of harm itself provides genuine information about the probability of harm; this fact has led some to suggest the use of an "ex post negligence" standard, under which negligence is assessed based on the information available ex post, rather than ex ante.[129] But hindsight bias suggests that decision makers weigh the fact of harm heavily in assessing the probability of

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[128] See, e.g., Neil D. Weinstein, Unrealistic Optimism About Future Life Events, 39 J. Personality & Soc. Psychol. 806, 806 (1980); Neil D. Weinstein, Unrealistic Optimism About Susceptibility to Health Problems: Conclusions from a Community-Wide Sample [hereinafter Unrealistic Optimism], 10 J. Behav. Med. 481 (1987). For discussion of the distinction between being below the average person's probability of a negative event and being below the average probability of that event (which could in fact be true for the majority of people), see Christine Jolls, Behavioral Economic Analysis of Redistributive Legal Rules (unpublished paper prepared for upcoming Vanderbildt Law Review Symposium).

[129] Guido Calabresi & Alvin K. Klevorik, Four Tests for Liability in Torts, 14 J. Legal Stud. 585, 590 (1985).

harm even when the fact of harm does not provide any new information about that probability.[130]

The findings on hindsight bias provide new empirical support for the old idea that such bias may distort negligence determinations. However, despite the vast law and economics literature in the area of torts, no attention seems to have been paid to the potentially significant implications of hindsight bias for achieving optimal deterrence—the goal posited by that literature, and the goal on which we focus here. (Thus, we accept this goal for purposes of our prescriptive analysis; we do not necessarily endorse this goal from a normative perspective.) Law and economics scholars generally approve of the use of the negligence standard for achieving that goal; that standard, if applied in an error-free fashion, leads to an efficient level of precaution (although other standards will as well).[131] These scholars have also analyzed reasons that legal rules, including the negligence standard, may be imperfectly applied, but they do not offer any clear prescriptions for addressing this problem, since as they see it, the problem does not have a clear direction; either underdeterrence or overdeterrence relative to correct application of the cost-benefit standard is possible.[132] In contrast, we can offer clear prescriptions because the hindsight bias points in a clear direction: overdeterrence (again relative to what correct cost-benefit analysis would produce).

In fact the law in areas such as patent law already takes clear steps to address the problems caused by hindsight bias. Thus, as Jeffrey Rachlinski has recently pointed out, patent courts are required to guard against hindsight bias in determining whether an invention was "nonobvious" at the time of invention—despite its now (perhaps) seeming obvious—by looking to such "secondary considerations" as "'commercial success, long felt but unsolved need, [and] failure of others.'"[133] But in the area of tort law the existing

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[130] See id. at [text around n. 27] for an example of such a situation.

[131] Steven Shavell, Economic Analysis of Accident Law 8 (1987).

[132] See, e.g., Jason S. Johnston, Bayesian Fact-Finding and Efficiency: Toward An Economic Theory of Liability Under Uncertainty, 61 S. Cal. L. Rev. 137, 154-64 (1987).

[133] Jeffrey J. Rachlinski, A Positive Psychological Theory of Judging in Hindsight, __ U. Chi. L. Rev. ___ (forthcoming 1998) [draft at 40] (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966)).

responses are partial and incomplete at best.[134] So deeply ingrained, in fact, does hindsight bias seem to be in the tort system that even when it is called to a court's attention, it may be difficult for the court to recognize or address it. A colorful example is provided by litigation in which one of the present authors (Thaler) was an expert witness. The litigation involved whether investment decisions involving $100 million in assets had been made in a negligent fashion. Although the court explicitly recognized that "case law . . . ties [this determination] to the circumstances extant at the time in question, rather than as they may appear in hindsight," the court characterized as "very imaginative" defendant's offer of testimony that "a decision based on information known at the time the decision was made can be evaluated as good or bad without regard to the outcome. In that way the evaluation is not biased by hindsight."[135] Although the judge was very active throughout the trial, he never suggested that the expert testimony offered by the plaintiff, which focused almost exclusively on the fact that the portfolio had lost money (rather than on the reasonableness of the investment decisions at the time they were made), was off-target or irrelevant. While the court ultimately accepted the "imaginative" argument of the defendant and ruled in his favor, its evident surprise at the nature of the argument suggests the pervasiveness of hindsight-based thinking in the tort system.

How might the law respond to hindsight bias in tort cases? An obvious response is the use of jury instructions that inform jurors of the bias and tell them to focus on the ex ante situation. Unfortunately, such debiasing techniques appear either to have no effect on decisions or to reduce hindsight bias by only a limited degree, leaving a significant gap between ex post and ex ante decision making.[136] The findings on the limited effect of debiasing techniques suggest that attempts by lawyers to employ such techniques may also be of limited effectiveness, although there is room here for future research on the role of lawyers. Because of the

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[134] Rachlinski describes several existing responses. See id.

[135] Johnson v. Johnson, 212 N.J. Super 368, 390, 391 n. 17 (1986).

[136] See, e.g., Arkes et al., supra note 122, at 306-307; Baruch Fischhoff, Perceived Informativeness of Facts, 3 J. Experimental Psychol. 349 (1977); Kamin & Rachlinski, supra note 123, at 97-99.

apparent limits on debiasing, we propose some alternative prescriptions—one simple and clear-cut, but limited to certain sorts of cases, and the other general and giving rise to important avenues for future research.

2. Prescriptions

(a) First prescription: Manipulate the information given to jurors

One means of responding to the problem of hindsight bias in tort cases involves manipulating the set of information given to jurors. Suppose that a food-processing company is claimed to have decided in a negligent fashion to use a particular chemical preservative in its products; imagine that the preservative ended up causing cancer in a small number of consumers. The company claims that *not* using the cancer-causing (as it turned out) preservative would have carried significant risks to customers in terms of food contamination. We know that if jurors are told that the preservative was used and ended up causing cancer, they will be likely to overestimate the probability of harm from the preservative and, thus, hold the food-processing company liable even if liability is not in fact justified under an unbiased application of the negligence standard. (Indeed, in this context the effects of hindsight bias will be exacerbated by the fact that the choice made by the defendant is an act of commission, rather than (as would have been the case had the preservative not been used) an act of omission.[137])

Imagine, however, that jurors are not told that the company decided to use the preservative; rather they are told only about the ex ante decision facing the company (whether to use the preservative). They learn about the benefits and costs of that strategy and must determine whether either pursuing it or failing to pursue it would have been negligent. In this way the jurors are transformed into ex ante decision makers: they don't know whether the "accident" that occurred (prompting the lawsuit) was harm from food contamination or harm from the preservative. Because they do not know what harm ended up materializing, they will not be led by hindsight bias to overestimate the probability of that harm. Their probability estimates for each type of harm—and their resulting

[137] Rita Ritov & Jonathan Baron, Reluctance to Vaccinate, 3 J. of Behavioral Decision Making 263 (1991).

assessment of whether either decision by the company would have been negligent—will be untouched by hindsight bias. In this way the effect of hindsight bias on negligence determinations may be eliminated. (If the decision that the defendant actually made was one that the jury determined to be negligent, outcome information would be introduced for purposes of computing damages.)

It is important to note the structure of this example: the defendant faced a choice of options, *each of which* could have caused harm. In this sort of case, jurors assessing the defendant's conduct will not know (if they are not told) whether the harm that prompted the suit was caused by choice of the first option or choice of the second. It is also important to note that various procedural steps would have to be taken to protect the secrecy of the defendant's choice; lawyers' affiliations, for example, would have to be kept from the jury, and witnesses could not be identified as defense-side or plaintiff-side. (One might worry that the food-processing company's employees would testify in a way that revealed what choice the company made. But it would not be in the company's interests to have its employees testify in such a one-sided fashion, since then jurors would suspect which choice was made and would tend to engage in hindsight-biased decision making to the defendant's detriment.)

In some cases, it may not be possible to keep the defendant's choice from the jury; the fact of the suit will make clear what that choice was. For example, in the well-known case of *Petition of Kinsman Transit Co.*,[138] in which a bridge owner failed to hire an operator to monitor the bridge, the fact of a suit may provide strong indication that an operator was not hired, resulting in an accident. In this sort of setting, a possible prescription (offered previously in the literature) involves bifurcation of trials, so that jurors deciding on liability do not learn any of the details of the accident until an initial determination of liability is made.[139] Although we think this is a

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[138] 338 F. 2d 708 (1964).

[139] Hal R. Arkes & Cindy A. Schipani, Medical Malpractice v. the Business Judgment Rule: Differences in Hindsight Bias, 73 Oregon L. Rev. 587, 633-36 (1994); Norman G. Poythress, Richard Wiener, & Joseph E. Schumacher, Reframing the Medical Malpractice Tort Reform Debate: Social Science Research Implications for Non-Economic Reforms, 16 Law & Psychol. Rev. 65, 105-11 (1992); David B. Wexler & Robert F. Schopp, How and When to

sensible prescription in such settings, we note that it will not eliminate the effects of hindsight bias, since (as proponents of bifurcated trials recognize) "[t]he jury will undoubtedly know that they are not being asked simply to engage in academic exercise,"[140] and that (because a trial is being held) "a bad outcome must have occurred."[141] In contrast, in cases in which jurors need not know (because they cannot infer from the fact of a lawsuit) what choice the defendant made, it is possible to eliminate the hindsight bias completely. And there are many such situations: cases in which either of two options facing a physician could have caused harm or death to a patient; cases in which either the use or the failure to use a new technology could have harmed consumers; cases in which either revealing or failing to reveal suicide threats by a psychiatric patient could have resulted in suicide.

A further feature of our prescription here is that even if we are wrong about the effects of hindsight bias, the prescription seems unlikely to do a significant amount of harm. If hindsight bias is unimportant, then whether jurors are told what outcome occurred is irrelevant; either way, they are able to make a correct ex ante determination. Thus, the prescription either has no effect on decision making (if hindsight bias is not a problem) or represents an improvement over the current system (if hindsight bias is a problem).

(b) Second prescription: Alter the evidentiary standard

The result of hindsight bias, as described above, is that jurors will overestimate the probability that harm will occur (since harm did in fact occur). The determination of the probability of harm would conventionally be made under a "preponderance of the evidence" standard: if jurors think it more likely than not, based on the evidence, that the probability of harm was above the threshold level required for liability, they are to find the defendant liable. One might imagine counteracting the effects of hindsight bias by raising the evidentiary standard (as an alternative, not in addition, to the

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Correct for Juror Hindsight Bias in Mental Health Malpractice Litigation: Some Preliminary Observations, 7 Behavioral Sciences and the Law 485, 496 (1989).

[140] Wexler & Schopp, supra note 139, at 494.

[141] Arkes & Schipani, supra note 139, at 635.

previous proposal; the two together would produce overcorrection and, thus, underdeterrence). Thus, for example, if the jurors were to find the defendant liable only if the evidence suggested at least a seventy-five percent likelihood—rather than merely a fifty-one percent likelihood—that the critical harm probability threshold was met, then they might well reach the correct conclusion about liability: they would overestimate the likelihood attached to the critical threshold, but the overestimate might well be below the new required level.

The highest evidentiary threshold known to our legal system—the "beyond a reasonable doubt" standard—is used only in criminal cases. However, in civil cases an intermediate standard (higher than the preponderance standard, but less demanding than the "beyond a reasonable doubt" standard) is the "clear and convincing evidence" standard. This standard has been adopted by many states for punitive-damage determinations,[142] and a broadening of its use to all negligence determinations—or at least those in which hindsight bias seems most likely to present a significant problem—would provide a counterweight to the tendency of jurors to overestimate the probability that harm will occur. This, of course, is likely to be a second-best solution; in some situations defendants might be found not liable when, under a perfectly functioning system with no hindsight bias and no heightened evidentiary standard, they would be found liable.[143] This need not be the case, however, and even if it is, we might well tolerate a crude measure that produced some errors so long as it represented an improvement over the current system. Most importantly, there is much room for research focused on determining the precise degree of alteration in the evidentiary threshold that would best respond to the hindsight-bias problem—either across the board or in particular categories of cases. Our goal is more to suggest the value of research on this issue than to urge an immediate change in policy based on what we now know.

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[142] Developments in the Law – The Civil Jury, 110 Harv. L. Rev. 1408, 1531 (1997).

[143] Rachlinski, supra note 133, at 33-34.

To fix ideas for purposes of exploring these points, imagine first that hindsight bias produces a similar increase across cases in a juror's perceived likelihood that the negligence threshold is met. (So, for example, suppose that jurors generally overestimate by fifty percent the likelihood that the negligence threshold is met, based on the evidence presented.) In this circumstance, the overestimation of the likelihood that the negligence threshold is met could be precisely offset by a change in the evidentiary threshold. To see this point, imagine that the likelihood that the negligence threshold has been met is graphed as a function of the strength of the evidence. In the absence of hindsight bias, the function will cross the fifty-percent (preponderance) cut-off at a given level of evidentiary strength, and all cases in which the evidence is stronger than that should produce findings of liability. But with hindsight bias, jurors will overestimate the likelihood that the negligence threshold has been met, and this will produce an upward shift in the function we are imagining; as a result, too many cases will cross the preponderance line. But if that line itself is shifted up by an appropriate amount, the hindsight-influenced function will cross it at precisely the same level of evidentiary strength as the one at which the original function crossed the preponderance standard. (For instance, if the likelihood that the negligence threshold has been met is a linear function of the strength of the evidence, half of all cases in the system meet the threshold under the preponderance standard, and jurors overestimate by fifty percent the likelihood that the threshold is met, then a move to a seventy-five-percent likelihood requirement would result in the jurors' finding negligence in precisely the half of cases in which it should be found.)

If hindsight bias produces different degrees of distortion in jurors' probability estimates across different types of cases, then a shift to a higher evidentiary standard might result in underdeterrence of some defendants (specifically those whose actions will not be judged in a particularly hindsight-biased way). But as long as the increase in the evidentiary standard is modest relative to what hindsight bias in the *average* case warrants, the change would produce fewer "underdeterrence errors" (findings of no liability for defendants who should be found liable) than "overdeterrence errors" (findings of liability for defendants who should not be found liable). And the change from a move to the

"clear and convincing evidence" standard would be a relatively modest one; a survey of federal district court judges found that in the judges' view that standard requires a likelihood of sixty to seventy percent, compared to the fifty-one percent threshold under the preponderance standard.[144] (Of course, more interesting would be data on how *jurors* view the two standards.) Moreover, to the extent that future research can help to pin down the way in which hindsight bias differentially affects different sorts of cases (assuming such differential effects exist), the change in the evidentiary standard may be calibrated to the degree of the hindsight-bias problem.

One response to this analysis is that the reason jurors tend to find defendants liable even when liability is not legally warranted is *not* that jurors overestimate the probability of harm, but simply that they want to compensate tort victims. Our first prescription addresses the latter issue as well as the former, for if jurors do not know what harm occurred, it is difficult for them to engage in compensation-based decision making. (In the case of the food-processing company, the jurors, to ensure compensation for the harm that occurred, would have to say that the company was negligent whether it used the preservative or refrained from using it—probably not a likely scenario.) But as far as the second prescription is concerned, the problem of compensation-based decision making remains. So if this is what is going on, jurors may continue to find defendants liable, regardless of a higher evidentiary threshold. But there is no reason to think the existence of a higher threshold will make things worse in this situation, and so as long as there are some cases in which jurors try faithfully to apply the negligence standard, moving to the higher evidentiary threshold may improve decision making.

A final objection might be that altering the evidentiary standard would not (it is claimed) survive the Kantian-Rawlsian publicity condition, which means, roughly, that principles of justice must be defensible publicly, and their basis and content must not be secret.[145] The question is whether it is coherent to tell jurors that "Although this case should be decided by the preponderance of the evidence, we

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[144] United States v. Fatico, 458 F. Supp. 388, 410 (E.D.N.Y. 1978).

[145] John Rawls, A Theory of Justice (1971). This issue was raised by Jon Elster in comments on an earlier draft.

know that you are likely to think irrationally, so therefore we raise the threshold to clear and convincing evidence." We do not believe that there is anything incoherent, or violative of the publicity condition, in an idea of this sort. In both private and public life, people, acting individually or in groups, take steps to ensure against their own tendencies to make mistakes. (We discussed in Part I.A the steps that people frequently take to deal with problems of bounded willpower.) Raising the standard of proof to prevent errors is consistent with much of the law of evidence, which is also designed to respond to cognitive errors. As just one example, consider the general ban on admission of evidence of prior crimes.[146] A public defense of such steps is perfectly intelligible.

3. Other applications

The discussion to this point has focused on tort cases decided under the negligence rule, but similar issues may arise in other areas of law in which juries (or judges) must determine whether an ex ante standard was met while armed with the knowledge that a negative event in fact materialized. One example is securities fraud litigation, whose perceived excesses prompted Congress to enact the Securities Litigation Reform Act of 1995. In a typical securities fraud case, jurors are confronted with a company whose stock price experienced a dramatic fall, and they are required to assess whether a particular issue or problem facing the company, whose disclosure prompted the fall, should have been disclosed at an earlier stage (typically before it had become an issue or problem). Jurors in such a case are required to make an after-the-fact determination of whether a reasonable ex ante decision maker would have thought the prospective issue or problem "material" to the average shareholder based on the information available at the time.[147] The problem is that this determination must be made against the backdrop of knowledge that the issue or problem in fact materialized, and produced a large drop in the company's stock price. In this situation, jurors will likely find it difficult to see how a reasonable ex ante decision maker might have thought the prospective issue or problem

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[146] Fed. Rule Evid. [cite].

[147] TSC Industries, Inc. v. Northway, Inc., 426 U. S. 438 (1976); see generally R. Clark, Corporate Law § 8.10.4 (1986).

nonmaterial. Consistent with this analysis, the main predictor of whether a securities fraud action is brought seems to be whether there has been a large change in the company's share price, not whether the company's behavior was reasonable from an ex ante perspective.[148]

Another example here involves damage suits for violations of the fourth amendment. A risk in such suits is that if the allegedly illegal search did in fact produce damaging evidence (say, drugs or other contraband), then decision makers are likely to conclude that the law enforcement agency's behavior was reasonable. This will be true even if, from an ex ante perspective (without knowing the eventual outcome), this behavior would not have been found reasonable.

B. Information Disclosure and Government Advertising

1. Background

Suppose it is agreed that individuals lack adequate information on a given subject—for example, workplace safety, appliance energy efficiency, or the effects of drug use. In some such instances the government may seek to foster comparison shopping and informed decision making (as in the federal truth-in-lending law, which requires lenders to announce interest rates, measured the same way); in other instances the government may have a specific policy goal (reducing drug use, encouraging the use of energy-efficient refrigerators). Conventional economics acknowledges the possible desirability of each of these goals (the second in the case of phenomena such as externalities), and it often advocates, as means of achieving them, providing additional information to citizens, either through a mandate to the relevant private actors (for instance, employers), or through provision of information by the government itself.[149]

The prescription to "provide more information" is striking in its spareness. Behavioral analysis suggests that this prescription is far *too* spare. "Provide more information" says nothing about the *way* in

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[148] See Janet Cooper Alexander, Do the Merits Matter? A Study of Settlements in Securites Class Actions, 43 Stan. L. Rev. 497 (1991); James Bohn & Stephen Choi, Fraud in the New-Issues Market: Empirical Evidence on Securities Class Actions, 144 U. Pa. L. Rev. 903 (1996).

[149] See, e.g., Joseph E. Stiglitz, Economics of the Public Sector 90-91 (1986).

which the information will be provided, and yet we know from much of what has been said already, as well as from empirical work by scholars such as W. Kip Viscusi, that this will matter a great deal.[150] Thus, for example, we know that people's perceptions of the probability of uncertain events is influenced by the salience of the presentation of these events.

There are several implications of this. One is "anti-prescriptive": Prescriptions directed toward fostering comparison shopping—the first government goal mentioned above—will often be incomplete and may even be paralyzing, since there is often no "neutral" way to present information. The second implication is that effective prescriptive strategies for achieving the second goal mentioned above—discouraging particular types of behavior—must take behavioral factors into account. It is not enough simply to "provide information." We discuss several examples of this below.

2. Anti-Prescription

Consider the following example of a government attempt to foster informed decision making: In the case of defined contribution plans such as 401(k)s, the Labor Department, the relevant government authority, has ruled that employers must give workers investment alternatives, and must provide information about those alternatives (such as risk and returns); but firms are not allowed to offer "advice" as to how to invest. We think that such spare guidelines place employers in a very difficult position. The reason is that the way firms decide to describe and display information on investment alternatives will have a powerful impact on the choices employees make.

Consider in this connection a recent study of the division of retirement savings by university employees between two different

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[150] See, e.g., W. Kip Viscusi, Individual Rationality, Hazard Warnings, and the Foundations of Tort Law, 48 Rutgers L. Rev. 625, 630-36 (1995); W. Kip Viscusi, Predicting the Effects of Food Cancer Risk Warnings on Consumers, 43 Food Drug Cosm. L.J. 283, 290-98 (1988); W. Kip Viscusi et al., An Investigation of the Rationality of Consumer Valuations of Multiple Health Risks, 18 Rand J. Econ. 465, 477-78 (1987).

funds, a safe one (bonds) and a risky one (stocks).[151] All the employees were shown actual historical data on the returns of the two funds, but this information was displayed in two different ways; one group was given the distribution of one-year rates of return, while the other was given a simulated distribution of 30-year rates of return. Those shown the 30-year returns elected to invest nearly all their savings in stocks, while those shown the one-year returns invested a majority of their funds in bonds. Our point is not that one of these outcomes is better. Our point is simply that in the real world, he who provides information ends up giving advice.

This is an example in which the prescription to "provide more information" may be paralyzing; in other instances it may simply be incomplete. Thus, suppose that the prescription is that certain private actors be required to provide "information"; what does this mean? If it means that those who expose people to a dangerous substance or product in the workplace (say benzene) must provide them with accurate information about the danger, this leaves open a tremendous range of possibilities. The actors subject to the mandate will often have an interest in providing the least scary, most pallid version of the information possible (for example, "benzene has been associated with a statistical increase in risk"), while regulators might want the most scary, salient message available (say, "exposure to benzene will increase your risk of getting CANCER and other FATAL diseases"). Of course the best message in this case, if the goal is accurate knowledge, may well be somewhere in between. An important goal of the analyst's task in making prescriptions in this area is to say *how* the information should be provided—not just *that* it should be provided.

In still other contexts, such as ones in which the presentation of information will affect people's preferences rather than just their perceptions of risk, it is not even clear in theory what is meant by ensuring "informed decision making." It is not even clear that there are steady or stable background preferences that might be "informed." The preferences can themselves be an artifact of the method of informing. For instance, one of the central features of

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[151] Shlomo Benartzi & Richard H. Thaler, Risk Aversion or Myopia? Choices in Repeated Gambles and Retirement Investments (working paper, University of Chicago, 1998).

Kahneman and Tversky's prospect theory is that people evaluate outcomes based on the change they represent from an initial reference point, rather than based on the nature of the outcome itself; also, losses from the initial reference point are weighted much more heavily than gains.[152] This aspect of prospect theory (like its other features) is based on evidence about actual choice behavior.[153] The evaluation of outcomes in terms of gains and losses from an initial reference point, coupled with the special aversion to losses, means that it matters a great deal whether something is presented as a gain or a loss relative to the status quo; a perceived threat of a loss relative to the status quo weighs more heavily than a perceived threat of foregoing a gain. In such cases it is difficult to say which individual is "informed"—the one who is told of the perceived threat of a loss or the one who is told of the perceived threat of foregoing a gain. In this and other contexts, preferences are not preexisting but rather "constructive, context-dependent," analogous to the balls or strikes that do not predate the situation of choice and that "ain't nothing till" the umpire calls them.[154]

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[152] See Kahneman & Tversky, supra note 10, at 277-79.

[153] See id. at 273 (outcomes are viewed differently depending on whether they come in the forms of gains or losses); id. at 279 (losses are weighted more heavily than gains). Another feature of how outcomes are viewed, both empirically and under prospect theory, is that a given change produces less reaction the further a decision maker is from her reference point. Thus, for example, the value difference between $10 and $20 is greater than the value difference between $1000 and $1010, both for gains and for losses, assuming a reference point of $0. In terms of the shape of the "value function" for decision makers (a function giving the value of each outcome – this is prospect theory's counterpart to the utility function), this suggests a function that is concave for gains and convex for losses; only with that shape are both gains and losses viewed as less significant the further the decision maker is from her reference point. This shape of the value function is further supported by evidence of attitudes toward risk: people appear generally (though there are exceptions) to exhibit risk-averse attitudes towards gains but risk-seeking attitudes toward losses, and this suggests concavity of the value function for gains and convexity for losses. See id. at 268. This pattern of concavity and convexity has received considerable empirical support. See id. at 278; Peter C. Fishburn & Gary A. Kochenberger, Two-Piece Von Neumann-Morgenstern Utility Functions, 10 Decision Sciences 503, 510 (1979).

[154] Amos Tversky & Richard H. Thaler, Preference Reversals, in Richard H. Thaler, The Winner's Curse 79, 91 (1992).

3. Prescriptions

Suppose now that the agreed-upon goal is not to foster "informed decision making," but to discourage particular types of behavior. Conventional economics would view this as a desirable goal at least to the extent that fully-informed consumers would not engage in the behavior in question, and to an even greater extent if the behavior in question produces externality effects. And to achieve this goal, conventional economics would again prescribe, as one possible means of achieving it, "more information." (Other, probably more usual, means include taxation or regulation designed to discourage the unwanted behavior.) Quite obviously, though, some ways of providing information are more effective than others. There is nothing surprising about this statement. Presumably, when firms pay millions of dollars to advertising agencies to create splashy new ad campaigns, they think they are getting something for their money. Likewise, there is an enormous marketing literature about how best to shape people's behavior in desired directions. These points apply equally to the government. Below we develop briefly some specific prescriptions for achieving goals that involve changing people's behavior.

(a) First Prescription: Exploit Loss Aversion

As just noted, individuals tend to weight losses far more heavily than gains. As a result, framing consequences in terms of losses rather than gains is likely to be far more effective in changing behavior.[155] A well-known illustration of this sort of framing effect is a study involving breast self-examination; pamphlets describing the positive effects of breast self-examination (for example, women who undertake such examinations have a greater chance of finding a tumor at a treatable stage) are ineffective, but there are significant changes in behavior from pamphlets that stress the negative consequences of a refusal to undertake self-examinations (women who fail to perform such examinations have a decreased chance of

[155] Cf. Edward McCaffery, Daniel J. Kahneman & Mathew L. Spitzer, Framing the Jury: Cognitive Perspectives on Pain and Suffering Awards, 81 Va. L. Rev. 1341 (1995) (effect of gain versus loss framing on magnitude of damage awards).

finding a tumor at a treatable stage).[156] Note that this example illustrates how the provision of information may be a more natural tool than taxation or regulation for discouraging some forms of behavior (such as the failure to perform a self-examination). Another familiar example of the effects of framing involves efforts to inform people of the advantages of energy insulation: an emphasis on the gains from insulation produced far less change than an emphasis on the losses from noninsulation.[157] In general, people are far more likely to act when told, "if you do not use this strategy, you will lose X amount," than when told, "if you do use this strategy, you will save X amount."

(b) Second prescription: Exploit salience

Effective prescriptive strategies need to take account of the fact that vivid and personal information will often be more effective than statistical evidence. This sort of information has a high degree of salience, and, as a result of the availability heuristic, people will tend to respond to it by attaching a higher probability to the event in question. Thus an anti-drug advertisement, showing a frying egg with the announcer's voice claiming, "this is your brain on drugs," may well have had a substantial impact on behavior, far more substantial than other, flatter advertisements; availability suggests that the former ad would produce a higher perceived probability of negative effects from the drug than the latter.

(c) Third prescription: Avoid the pitfalls of overoptimism

As noted in the previous section, a common feature of human behavior is overoptimism.[158] This behavior is not specific to the young, although it may be diminished as people move beyond middle to old age, as Richard Posner has suggested.[159] What does

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[156] Beth Meyerowitz & Shelly Chaiken, The Effect of Message Framing on Breast Self-Examination, 52 J. Personality & Soc. Psychol. 500, 506-09 (1987).

[157] Marti H. Gonzales et al., Using Social Cognition and Persuasion to Promote Energy Conservation: A Quasi-Experiment, 18 J. Applied Soc. Psychol. 1049, 1062 (1988).

[158] See supra.

[159] See Weinstein, Unrealistic Optimism, supra note 128 (overoptimism apparent in the general public); Richar A. Posner, Aging and Old Age 104-06 (1995).

this feature of behavior imply about government provision of information? Consider the choice between a safe-driving campaign focused on drivers' own driving and the ingenuous campaign actually adopted by the government: "Drive defensively: Watch out for the other guy." The government's campaign, perhaps self-consciously, responded to the fact that most people tend to believe that they are unusually safe drivers. This is a model of the sort of prescriptive approach advocated by behavioral analysis.

C. Behavior of Criminals

1. Background

Our discussion of prescriptive analysis has thus far focused on bounded rationality. But bounded willpower may also play a role. Consider the question of deterring criminal behavior. Economic analysis of this question typically starts from the premise that potential offenders will be deterred from criminal acts if the expected costs of those acts exceed their expected benefits.[160] Potential offenders are imagined to make at least a rough calculation of these costs and benefits in the process of making their decisions. Bounded rationality suggests that people may make systematic (as opposed to random) errors in computing these costs and benefits; for example, as described above, individuals tend to judge the likelihood of uncertain events (such as getting caught for a crime) by how available such instances are to the human mind, and this may depend on factors unrelated to the actual probability of the event. This analysis suggests the desirability, from a prescriptive standpoint, of making law enforcement highly visible, holding constant the actual probability that offenders will be caught; it suggests, for example, the good sense of the familiar method of parking-ticket enforcement—sticking large, brightly-colored tickets that read "VIOLATION" in large letters on the drivers' side window, where they are particularly noticeable to drivers passing by—as opposed to a less costly approach (putting small, plain tickets under the windshield wiper on the curb side of the street (convenient for the parking officer to reach)). Another example here is "community policing," now widely practiced across the country; by making more

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[160] Shavell, supra note 35.

visible and memorable the presence of police (as, for example, by having them walk their beats rather than ride in patrol cars), authorities can, it is suggested, increase the deterrence of potential criminals without altering the actual probability of apprehension. Empirical evidence suggests that this is what actually occurs in the case of community policing.[161]

But even if one assumes that potential offenders can accurately compute the costs and benefits of crime, bounded willpower suggests that they will often behave in ways at odds with conventional economic analysis, due to problems of self-control. A central feature of much criminal behavior is that the benefits are immediate, while the costs (if they are incurred at all) are spread out over time—often a very long time. Economic analysis assumes that such future costs are discounted to their present value at the rate at which individuals can borrow or lend according to their circumstances.[162] A. Mitchell Polinsky and Steven Shavell have recently generalized this analysis by suggesting that potential criminal offenders may have unusually high discount rates, so that lengthy terms of imprisonment will have relatively little effect (because years far in the future will be discounted so heavily).[163] Behavioral economic analysis carries this idea further by incorporating self-control issues often emphasized by criminologists.[164]

2. Prescriptions

As just noted, the existing economic analyses assume a constant discount rate (although perhaps a high one); this means that the difference between the attractiveness (or aversiveness) of a reward (or punishment) today versus tomorrow is the same as the difference between a year from now and a year and one day from now. In

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[161] James Q. Wilson & George L. Kelling, Making Neighborhoods Safe, 236 The Atlantic Monthly 46 (Feb. 1989).

[162] See, e.g., Gary S. Becker, Crime and Punishment: An Economic Approach, 76 J. Pol. Econ. 169, 179 (1968).

[163] A. Mitchell Polinsky & Steven Shavell, On the Disutility and Discounting of Imprisonment and the Theory of Deterrence 12-13 (Harvard Law School John M Olin Center for Law, Economics, and Business, Discussion Paper No. 213, Sept. 1997).

[164] See, e.g., James Q. Wilson & Allan Abrahamse, Does Crime Pay? 9 Justice Q. 359, 372-74 (1992).

contrast to this theory, there is considerable evidence that people display sharply declining discount rates.[165] This means that impatience is very strong for near rewards (and aversion very strong for near punishments) but that each of these declines over time—a pattern referred to as "hyperbolic discounting."[166] In an illuminating overstatement, Jon Elster has referred to this as the "absolute priority of the present"—akin to the "absolute priority [of the self] over other persons: I am I—while they are all 'out there.'"[167] Richard Posner has recently applied these ideas to issues of aging and old age,[168] and their application to criminal offenders is supported by the idea that such offenders often behave "impulsive[ly]" and then have to "exaggerat[e] the benefits of crime" in order to justify their behavior to themselves later.[169] (This would not occur with the ordinary discounting assumed by most conventional economic analysis; decisions would not be regretted later because with that form of discounting there is no time inconsistency of preference.[170])

What does hyperbolic discounting imply for effective deterrence of criminal behavior? With this sort of bounded willpower on the part of potential offenders, the difference between not getting caught and being imprisoned for, say, a year differs dramatically from the difference between being imprisoned for ten years and being imprisoned for eleven years (even apart from any fixed costs that may accompany the fact of conviction). While the standard theory says that these two things differ only insofar as the costs of imprisonment in year eleven must be discounted to present value in order to be compared with the loss of wages and personal freedom in year one, behavioral economic analysis (and basic common sense)

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[165] See, e.g., George Loewenstein & Richard H. Thaler, Intertemporal Choice, in Richard H. Thaler, The Winner's Curse 95-96 (1992); Uri Benzion, Amnon Rapoport, & Joseph Yagil, Discount Rates Inferred from Decisions: An Experimental Study, 35 Management Science 270 (1989).

[166] David Laibson, Golden Eggs and Hyperbolic Discounting, 112 Q. J. Econ. 443 (1997).

[167] Jon Elster, Ulysses and the Sirens: Studies in Rationality and Irrationality 74 (1979).

[168] Posner, supra note 159, at 84-94, 281-82.

[169] Wilson & Abrahamse, supra note 164, at 374.

[170] See, e.g., Robert H. Strotz, Myopia and Inconsistency in Dynamic Utility Maximization, 23 Rev. Econ. Stud. 165 (1956) (time inconsistency with hyperbolic but not ordinary (exponential) discounting).

tells us that this is not so. Short punishments will thus have much more effect than long punishments as a result of the "priority of the present"; adding years onto a sentence will produce little additional deterrence. (This is also true under Polinsky and Shavell's approach, but for a different reason.)

Our analysis is consistent with empirical evidence suggesting that criminal behavior is correlated with high levels of self-control problems. Studies have found, for example, that drunk-driving behavior is significantly correlated with a general practice of not wearing a seat belt—itself a behavior that seems to suggest a very high weight on the present, and thus a lack of self-control in the sense used here.[171] Another interesting piece of empirical evidence concerns offenders' views of sentences of different lengths. One study found that they view a five-year term of imprisonment as, on average, only twice as bad as a one-year term; the five-year term had a perceived severity of 200, compared to 100 for the one-year term.[172] This alone is also consistent with a high discount rate—a rate of roughly .5. But with that discount rate, the difference between a five- and ten-year term should be quite small (approximately 6 on the severity measure); in fact, the difference was 300.[173] This difference is also somewhat higher than hyperbolic discounting would suggest; if the difference between 100 and 200 represents a .25 weight on all years after the first year (so that the five-year term's severity is 100 + 25 + 25 + 25 + 25 = 200), then the ten-year term's severity would be 325—much closer than the 206 predicted by the non-hyperbolic approach, although still less than the actual severity rating of 500. These data are of course only suggestive; we have not shown that the bounded willpower approach leads to improved predictions of actual criminal behavior. Empirical work on actual behavior of this sort is notoriously difficult, but scholars such as Steven Levitt have begun to demonstrate the possibilities in this area.[174] A full analysis of

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[171] Martin Friedland, Michael Trebilcock, & Kent Roach, Regulating Traffic Study, in Securing Compliance: Seven Case Studies 165 (1990).

[172] William Spelman, The Severity of Intermediate Sanctions, 32 J. Research Crime & Delinquency 107, 113 (1995).

[173] Id.

[174] See, e.g., Steven D. Levitt, Using Economic Cycles in Police Hiring to Estimate the Effect of Police on Crime, 87 Am. Econ. Rev. 270 (1997).

criminal behavior would also need to incorporate other factors not considered here (such as the role of community): our goal is only to sketch some of the many ways in which conventional economic analysis of criminal law can be usefully extended using the tools of behavioral analysis.

V. Normative Analysis: Anti-Antipaternalism

This Part turns to the normative issues raised in the introduction. As noted there, conventional law and economics is often strongly antipaternalistic in its orientation. The idea of "consumer sovereignty" plays a large role; citizens, assuming they have reasonable access to relevant information, are thought to be the best judges of what will promote their own welfare. Yet many of the instances of bounded rationality discussed above call this idea into question—and also, as we will emphasize below, call into question the idea that intervention by government actors, who themselves may face the same cognitive or motivational problems as everyone else, can improve matters. In this way bounded rationality pushes toward a sort of anti-antipaternalism—a skepticism about antipaternalism, but not an affirmative defense of paternalism. We also note (although we do not explore this point here) that while bounded rationality may increase the need for law (if government's failings are less serious than citizens'), bounded self-interest may reduce it, by creating norms that solve collective action problems even without government intervention.[175]

A. Citizen Error

Many of the forms of bounded rationality discussed above call into question the idea of consumer sovereignty. Consider overoptimism—the tendency of most people to assume that their own risk of a negative outcome is far lower than other people's. Consistent with this phenomenon, young smokers appear to overestimate by significant margins the likelihood that they will

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[175] A standard argument for law under the conventional economic approach is that self-interested people will create collective irrationality; if people are boundedly self-interested, however, this problem may tend to disappear.

quit.[176] Similarly, the effect of salience may lead to substantial underestimation of certain risks encountered in everyday life (for example, the risks from poor diet), since these harms may not be very salient. When overoptimism is combined with salience, it appears likely that people will underestimate many risks. We emphasize that these problems are not ones of insufficient information per se; they are ones of insufficient ability to process accurately the information one possesses insofar as that information bears on one's own risks. Thus, for example, people may have adequate information about the risks of smoking,[177] but this does not at all imply that they have adequate perceptions of the risks of smoking that *they themselves face*.[178] Even if people can obtain accurate statistical knowledge, statistical knowledge may not be enough to inform actual choices. It does not follow from this that information is useless; it is just that having information per se does not automatically imply optimal behavior.

Further questions about the idea of consumer sovereignty arise from the gap between "decision" and "experience" utility. It is often assumed that the utility of actual experience is best measured by the anticipated utility as revealed by people's decisions. A's choice to do X best shows what welfare will be gained by A's doing X. This assumption is often treated as an axiom, or at least as a proposition that could not be falsified. But behavioral research shows that people's judgments about their future experience at the time of decision can be mistaken, in the sense that people sometimes have a hard time (even apart from the sorts of informational issues recognized by conventional economics) assessing what the experience will actually be like.[179] Thus, for example, people do not accurately predict the consequences of winning the lottery or becoming paraplegic. They tend to underestimate their ability to adapt to negative changes, a point that may bear on law and policy

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[176] Paul Slovic, What Does It Mean To Know a Cumulative Risk, ___ Duke L.J. ___ (forthcoming 1998).
[177] W. Kip Viscusi, Smoking (1993).
[178] Slovic, supra note 176.
[179] See Daniel Kahneman, New Challenges to the Rationality Assumption, in The Rational Foundations of Economic Behavior (Kenneth Arrow et al. eds, 1996); George Loewenstein & David Schkade, Wouldn't It Be Nice? Predicting Tastes and Feelings (forthcoming 1998).

in such areas as global climate change.[180] And they overestimate the gains in happiness they will experience from events such as winning the lottery.

An especially interesting example of the gap between decision and experience utility comes from studies dealing with HIV testing. At the time of decision whether to test, people are quite terrified of their reaction to finding out that they are HIV-positive; they predict a high degree of panic and depression. But a recent study suggests that people are able to adapt to the bad news, and their panic and depression are far less severe than they thought ex ante.[181] If the experience is less bad than expected, then perhaps people will "undertest" in terms of their own welfare. If people underpredict their powers of adaptation to a positive result, there may be a legitimate domain for initiatives designed to correct mispredicted utility.

This suggestion raises a complex normative question: Is a person's measure of welfare after the test results come back the appropriate measure of value? Perhaps people, through coping mechanisms, are able to adapt to disease better than they anticipate in advance, but does this mean that disease is a less severe problem than pre-test attitudes would have suggested? On conventional utilitarian grounds, the answer is probably affirmative; the subjective experience is what counts. But a well-established challenge to utilitarian analysis suggests the possibility of a negative answer, on the ground that subjective experience may not be all that counts.[182] What we mean to suggest here is a simple point: people sometimes do mispredict their utility at the time of decision, and on conventional grounds, this phenomenon raises serious problems for the idea of consumer sovereignty.

B. Behavioral Bureaucrats

Any suggestion that the government should intervene in response to people's mistakes raises the question whether the

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[180] See George Loewenstein & Shane Frederick, Predicting Reactions to Environmental Change 52-74 (Max Baerman et al. eds 19977).

[181] Sieff et al., Anticipated Versus Actual Reactions to HIV Test Results, ___ Am. J. Psychol. ___ (forthcoming 1997).

[182] See Jon Elster, Sour Grapes (1993); Amartya Sen, Commodities and Capabilities (1985).

government will be able to avoid such errors. The prospects for productive and useful intervention may be smallest in the case of populist government; the actions of such a government, based heavily on pressures coming from citizens, may tend to be subject to the very same biases and errors that afflict citizens. (Thus behavioral analysis complements existing accounts of the problems with populism.) An example of the effects of populism is the Superfund statute, discussed in Part III.C; irregular perceptions of risk by ordinary people may tend to produce irregularities in regulation, as the cognitive errors that ordinary people make are replicated in statutory and administrative law.[183] The effects of social interaction may even make government action worse, and more dangerous, than individual errors. Our earlier discussion suggests a possible mechanism: Availability entrepreneurs in the private sector can heighten the demand for regulation, and public sector availability entrepreneurs can take advantage of, and heighten, this effect, by advocating anecdote-driven policy. Thus public choice accounts of legislation can work productively with behavioral accounts; there is a good deal of synergy between behavioral mechanisms and interest group leaders, many of whom are amateur (or professional?) behavioral economists. The pollutant-of-the-month syndrome in environmental law is paralleled by many measures responding to the crisis-of-the-month. These difficulties with populist government also point to problems with the referendum process.

But populist government is not the only worry. Government will often be subject to cognitive and motivational problems even if it is not populist. (Bureaucrats may also lack appropriate incentives to make decisions in the public interest.[184]) Thus, for example, there is no necessary reason to think that government officials are, by virtue of their offices, able to avoid overoptimism or predict experience utility. On the other hand, a degree of insulation from populist pressures, combined with knowledge of behavioral economics, might produce some improvement. New institutions may play a role;

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[183] See Noll & Krier, supra note 115; W. Kip Viscusi, Sources of Inconsistency in Societal Responses to Health Risks, in Fatal Tradeoffs 138-46 (1993).

[184] See Robert C. Clark, Contracts, Elites, and Traditions in the Making of Corporate Law, 89 Colum. L. Rev. 1703, 1719-21 (1989).

consider Justice Breyer's plea for an insulated body of specialized civil servants, entrusted with the job of comparing risks and ensuring that resources are devoted to the most serious problems;[185] Howard Margolis' behaviorally-informed suggestion that government should be required to ensure that all initiatives do "more good than harm";[186] even proposals for cost-benefit analysis, understood in a behavioral light as an attempt to overcome biases and confusions in both perception and motivation.[187] We also emphasize that government intervention need not come in highly coercive forms; perhaps distortions in people's decision making can be overcome by information campaigns falling well short of coercion. For instance, in the contexts of risks such as smoking, might debiasing techniques work to link the statistical evidence with the personal reality?

All of the foregoing ideas raise many complexities; and we have not even touched upon the complicated philosophical literature on the legitimacy of paternalism. Application of these ideas to any specific topic in law would require a much fuller development of many issues than the space in this Article permits. But we need not leave the ideas in purely abstract form; consider the following simple illustration of their application. Imagine that sunlamps are being sold in an unregulated market and that it is learned that many consumers fall asleep under the lamps, burning themselves badly. Consumers make this mistake in spite of warnings included on the package and in the instructions, perhaps because they fail to anticipate that lying in a warm place with one's eyes closed is likely to induce sleep. Let's call this an "unintended risk," meaning a risk that consumers fail to appreciate. The existence of this unintended risk leaves open the possibility of welfare-enhancing regulation. Suppose, for example, that an automatic timer can be added to the sunlamp at a cost of twenty-five cents, and that manufacturers have not included this feature because consumers do not anticipate that they will need it. We do not discuss here the issues raised by the possibility that a government mandate of the timer interferes with

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[185] See Stephen Breyer, Breaking the Vicious Circle (1993).

[186] See Howard Margolis, Dealing With Risk (1997).

[187] See John Graham & Jonathan Weiner, Risk vs. Risk (1996). Each of the solutions stated in the text may also be attractive to conventional economists on a variety of grounds.

freedom, rightly conceived. Nor do we address possible distributive issues (all will pay more for sunlamps, although perhaps only some failed to appreciate the risks of falling asleep). All we suggest is that an important part of the analysis involves asking whether the cost of requiring this safety-promoting feature (twenty-five cents per customer) is less than the cost of the unanticipated burns.

A central point of this example is that from the perspective of behavioral law and economics, issues of paternalism are to a significant degree empirical questions, not questions to be answered on an a priori basis. No axiom demonstrates that people make choices that serve their best interests; this is a question to be based on evidence. Of course the case for intervention is weakened to the extent that public institutions are likely to make things worse rather than better. What we are suggesting is that facts, and assessment of costs and benefits, should replace assumptions that beg the underlying questions.

Conclusion

Traditional law and economics is largely based on the standard assumptions of neoclassical economics. These assumptions are sometimes useful but often false. People display bounded rationality: they suffer from certain biases, such as overoptimism and self-serving conceptions of fairness; they follow heuristics, such as availability, that lead to mistakes; and they behave in accordance with prospect theory rather than expected utility theory. People also have bounded willpower; they can be tempted and are sometimes myopic. They take steps to overcome this limitations. Finally, people are (fortunately!) boundedly self-interested. They are concerned about the well-being of others, even strangers in some circumstances, and this concern and their self-conception can lead them in the direction of cooperation at the expense of their material self-interest (and sometimes spite, also at the expense of their material self-interest). Most of these bounds can be and have been made part of formal models.

In this article we have sketched some of the implications of enriching the traditional analysis by incorporating a more realistic conception of human behavior. We have insisted on the value and importance of using the three bounds in the economic analysis of

law; more tentatively, we have explored a series of legal problems in which the bounds may be significant. Obviously there is a great deal of research to be done, and one of our principal goals has been to outline areas that could benefit from further work, both analytic and empirical.

We do not doubt that replacing the simple maximizing model of economics with a more complicated psychological treatment comes at some cost. Solving optimization problems is usually easier than describing actual behavior. As Herbert Simon said, economics makes things hard on agents, but easy on economists; behavioral economics, we suggest, does the opposite. We recapitulate here some of the reasons we think the enriched model is worth the trouble for those interested in the economic analysis of law.

1. Some of the predictions of the standard model are simply wrong. For example, people can be both more spiteful and more cooperative than traditional analysis predicts, and this matters a great deal to law. It is also important to know that even in a world without transactions costs and wealth effects, the assignment of property rights alters the allocation of resources, and that this may be particularly true for certain forms of property-rights assignment (such as court orders). These features of the world matter greatly for making predictions and formulating policy.

2. In other cases economics makes no predictions (or incorrect predictions of no effect). Prominent in this category are the effects of presentation; since economic theory assumes that choices are invariant to the manner in which a problem is framed, it falsely predicts that the language of a media account or advertisement has no effect on behavior, holding the information content constant. In contrast, it is well established that people react differently to potential outcomes depending on whether they are perceived as foregone gains or out-of-pocket costs (losses), and that they are likely to think, mistakenly, that salient events are more common than equally prevalent but more subtle ones. These points bear on the supply of and the demand for law, and on the behavior of agents in their interactions with the legal system.

3. Standard economic theories of the content of law are based on an unduly limited range of potential explanations, namely optimal (or second-best) rules set by judges and rent-seeking legislation determined by self-interested log-rolling. Behavioral

economics offers other sources of potential explanation—most prominently, perceptions of fairness. We have tried to show that many laws which are seemingly inefficient and do not benefit powerful interest groups may be explained on grounds of judgments about right and wrong.

4. A behavioral approach to law and economics offers a host of novel prescriptions regarding how to make the legal system work better. Some stem from the improved predictions mentioned in point 2 above. Cognitive difficulties and motivational distortions undermine or alter conventional economic prescriptions about the jury's role, most notably in the context of assessing negligence and making other factual determinations. We have taken some preliminary steps in suggesting ways to reduce the costs of some of these problems.

5. A behavioral approach to law and economics produces new questions about possible mistakes by private and public actors. On the one hand, it raises serious doubts about the reflexive antipaternalism of some of economic analysis of law. On the other hand, it raises equivalent questions about whether even well-motivated public officials will be able to offer appropriate responses to private mistakes and confusion.

We hope that this article will encourage others to conduct the research, both theoretical and empirical, that will be needed to flesh out the behavioral approach for which we have argued here. This approach will use traditional economic tools, enhanced by a better understanding of human behavior. Thirty years from now, we hope that there will be no such thing as behavioral economics. Instead we hope that economists and economically oriented lawyers will simply incorporate the useful findings of other social sciences, and in so doing, transform economics into behavioral economics, and economic analysis of law into one of its most important branches.

Appendix: Framework and Summary of Applications

This appendix summarizes our framework for behavioral law and economics. It also lists the law and economics issues we analyze within each category of the framework. The specific behavioral mechanisms we draw upon, which are summarized here, do not constitute an exhaustive list of the mechanisms that might be relevant to law and economics; they simply reflect the mechanisms we have used here.

1.Bounded rationality

a. Judgment errors

self-serving bias (Babcock & Loewenstein, supra note x; Daniel Kahneman & Amos Tversky, Conflict Resolution, in Barriers to Conflict Resolution 44 (Kenneth Arrow et al. eds. 1995))

applications: bargaining around court orders; failed negotiations

availability heuristic (Kahneman & Tversky, supra note 8)

applications: environmental legislation, government advertising, anti-antipaternalism

hindsight bias (Fischoff, supra note 121)

applications: negligence determinations; other determinations of fact.

omission bias (Ritov & Baron, supra note 137)

applications: negligence determinations; other determinations of fact

overoptimism (Weinstein, supra note 128)

applications: government advertising, anti-antipaternalism

inability to predict experience utility (Kahneman, supra note 179)

applications: anti-antipaternalism

b. Decision making behavior

loss aversion (Kahneman & Tversky, supra note 10)

applications: government advertising

endowment effect (a corollary of loss aversion) (Kahneman, Knetsch, & Thaler, supra note 22)

applications: bargaining around court orders, mandatory contract terms, prior restraints on speech

2. Bounded willpower

"hyperbolic" discounting (Laibson, supra note 166)

applications: criminal behavior

3. Bounded self-interest

fairness behavior and spitefulness (Colin Camerer & Richard Thaler, 9 J. Econ. Perspectives 209 (1995)

applications: bargaining around court orders; bans on market transactions; prior restraints on speech

This Working Paper is a tentative and preliminary version of an article that will be published in the Stanford Law Review. Readers with comments should address them to:

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